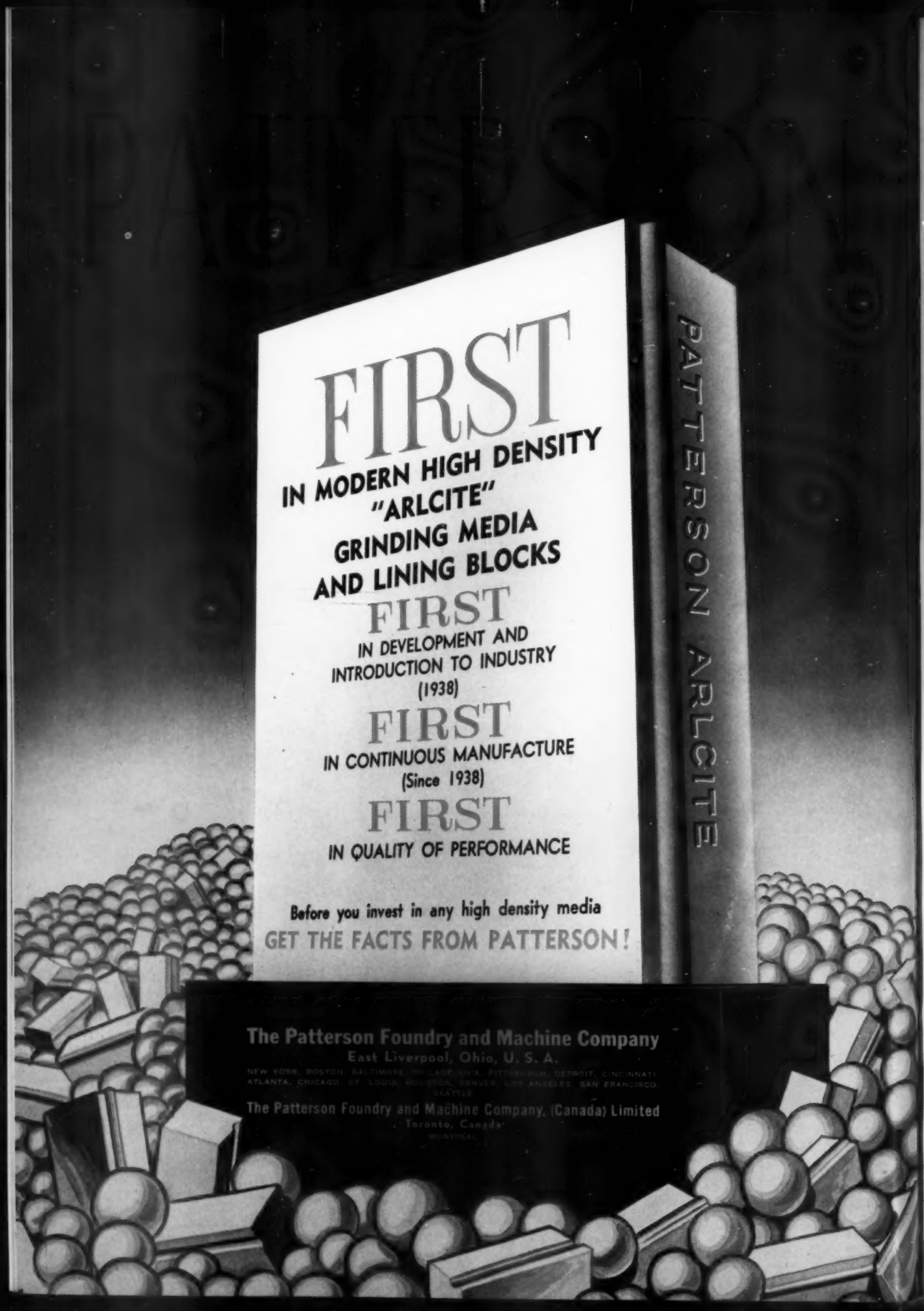
August • 1955

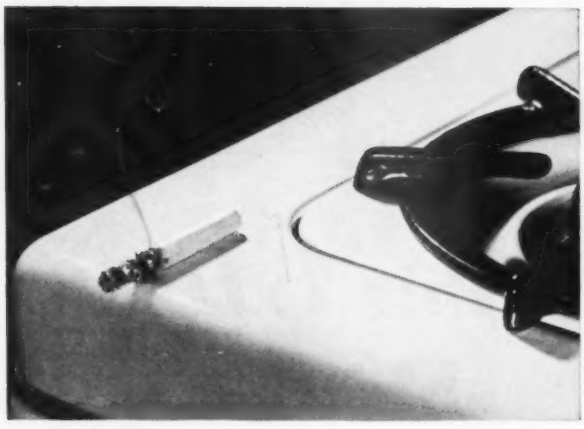
finish

THE MAGAZINE OF
Appliance AND
Metal Products MANUFACTURING

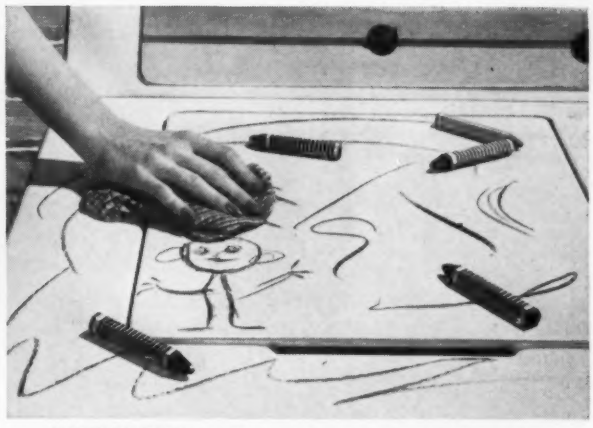
FROM RAW METAL TO FINISHED PRODUCT


FIRST
IN MODERN HIGH DENSITY
"ARLCITE"
GRINDING MEDIA
AND LINING BLOCKS
FIRST
IN DEVELOPMENT AND
INTRODUCTION TO INDUSTRY
(1938)
FIRST
IN CONTINUOUS MANUFACTURE
(Since 1938)
FIRST
IN QUALITY OF PERFORMANCE
Before you invest in any high density media
GET THE FACTS FROM PATTERSON!
PATTERSON ARLCITE
The Patterson Foundry and Machine Company
East Liverpool, Ohio, U. S. A.
NEW YORK, BOSTON, BALTIMORE, PHILADELPHIA, PITTSBURGH, DETROIT, CINCINNATI,
ATLANTA, CHICAGO, ST. LOUIS, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO,
SEATTLE
The Patterson Foundry and Machine Company, (Canada) Limited
Toronto, Canada
MONTREAL

PORCELAIN ENAMEL in your products would pass all these tests...



HEAT TEST. The red-hot embers of a burning cigarette don't damage the rock-like surface of porcelain enamel. Its glistening finish does not scorch or discolor as many kitchen surfaces do.



LIPSTICK TEST. Lipstick or children's crayons won't mar the hard, lustrous finish of porcelain enamel. A damp cloth quickly wipes away stains and dirt leaving the surface bright as new.

SHOCK TEST. A hot iron is placed on an ice-cold porcelain enamel drainboard. The sudden, shocking temperature change does not affect it. Many coatings would blister, buckle or discolor.

SCRATCH TEST. Vegetables or fruits for a salad can be cut on porcelain enamel without damaging the surface. Many work surfaces show dents or scars from knives or other sharp utensils.

If you make products that might benefit from the sales advantages of porcelain enamel, why not consider this lifetime finish the next time you redesign? Then you can offer products in a range of colors that don't fade or lose luster.

Experienced job enamelers are ready to work with you—not only on design problems but in the production of porcelain enameled parts. For nearly half a century many of these enamelers have specified Armco Enameling Iron as the base metal for their products. They know it is assurance of uniform quality from one shipment to the next. That's why it has become known as the "World's Standard Enameling Iron." Just fill in and mail the coupon for complete information.

ARMCO STEEL CORPORATION, 375-B Curtis St., Middletown, Ohio

Give me names of job enamelers

We manufacture_____

Name_____

Company_____

Street_____

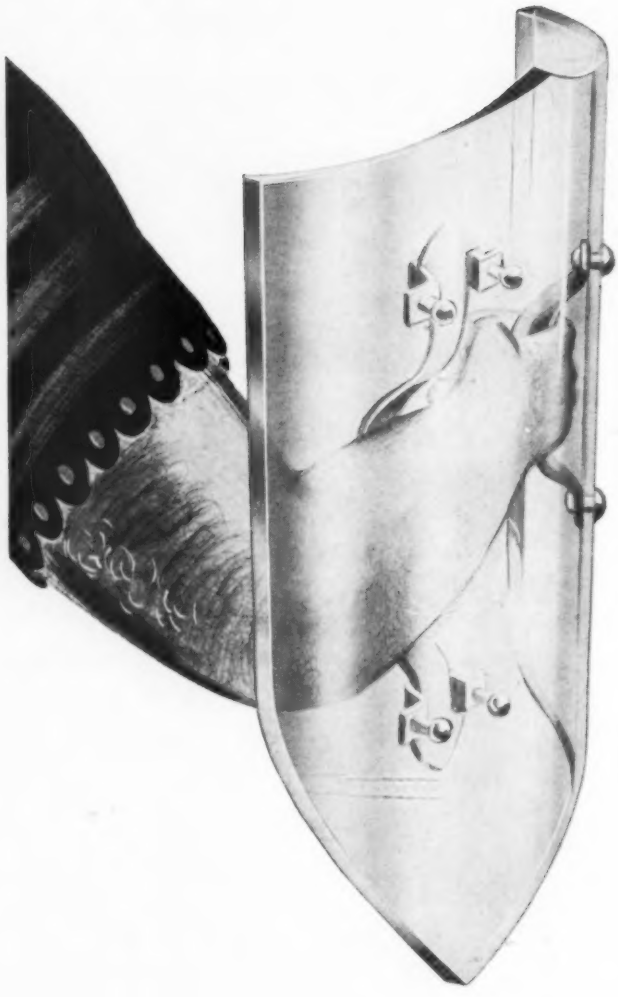
City_____ Zone____ State_____

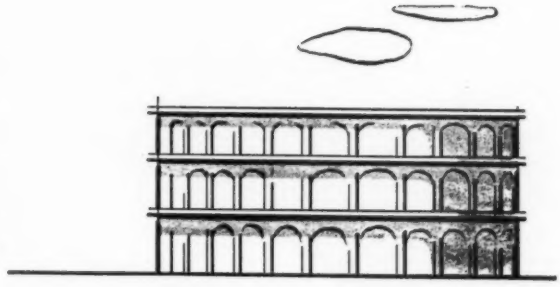
ARMCO

ARMCO STEEL CORPORATION MIDDLETOWN, OHIO

SPECIAL STEELS

SHEFFIELD STEEL DIVISION · ARMCO DRAINAGE & METAL PRODUCTS, INC. · THE ARMCO INTERNATIONAL CORPORATION





this *Glass* shield,

while symbolic,

represents some of the things a master craftsman can do with glass. It can be bowed to fit any desired shape, it can be drilled and shaped to exact tolerances.

It can be tempered to impart extreme resistance to impact — that is why safety regulations demand glass as a safety barrier when danger exists.

Let glass improve the utility of your product while it beautifies it.

Let Marsco's craftsmen-engineering team impart to your product all the advantages of glass

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

Special shapes for: Instruments, Gauges, Household and Industrial Appliances.

Marsco

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

August • 1955

VOL. 12 • NO. 8

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finish

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Telephone • TErrace 4-5280
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A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. Includes technical and practical information on plant facilities and manufacturing problems from raw metal to safe delivery of the finished product, with special emphasis on fabrication, metal preparation, metal finishing, assembly, and packaging and shipping.

Free controlled circulation to management, purchasing, engineering and key plant personnel in metal product manufacturing plants. To others, subscription price is $5.00 per year, domestic. To all other countries $8.00 per year (U.S. funds).

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METAL PRODUCTS MANUFACTURING
FROM RAW METAL TO FINISHED PRODUCT

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In they go

Out they come

Year after Year on
Inconel *Hanger Rods*

Have you tried Inconel® for hanger rods?

For long run economy in this service, you can depend upon Inconel.

Within standard enameling temperature ranges (1475 to 1550°F.) and on up to the range where high temperature ceramic coatings are applied (1850°F. approximately), Inconel delivers excellent heat and corrosion resistance. It resists oxidizing and other corrosive conditions common in enameling operations.

At those temperature levels, Inconel retains high creep strength. Even after years of continuous operation, Inconel rods of proper design show no stretch.

A change to wrought, light-weight Inconel rods can mean lower fuel costs, too. For with less dead weight in the furnace, it takes less fuel to get to heat and stay there.

What's true of Inconel for drop rods, is equally true for burning tools and furnace parts.

So if heat and corrosion are creating problems with items of this type, see what Inconel can do. You can get more information by writing for "Keep Operating Costs Down . . . When Temperatures Go Up." It's free and a useful booklet to have. For detailed technical assistance, call on Inco's Technical Service Section.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York 5, N. Y.

Inconel

INCO TRADE MARK **Nickel Alloys**

. . . for long life at high temperatures

To our Favorite Boss!

From the receptionist at the front door through to the last man on the loading platform—*all* of us here at Great Lakes Steel have a very important *something* in common. It is the knowledge that your continued and expanded need for our products determines the future and growth of every one of us, regardless of our individual jobs here.

It is the knowledge that *you*, Mr. Customer, are the boss!

That's why we at Great Lakes are seeing to it that our steel is the kind you have a right to expect from a specialist in flat-rolled products. We know the importance of prompt shipments, top quality, proper packaging and loading, dependable information, and clerical accuracy. We think you'll agree that our many satisfied customers are a pretty good indication that this policy is good business for all concerned.

Next time you have a problem in steel, call on one of our representatives to help you solve it. You'll be glad you did!

GREAT LAKES STEEL CORPORATION
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SALES OFFICES IN BOSTON, CHICAGO, CINCINNATI, CLEVELAND, HOUSTON, INDIANAPOLIS, LANSING, LOS ANGELES, NEW YORK, PHILADELPHIA, PITTSBURGH, ROCHESTER, ST. LOUIS, SAN FRANCISCO AND TORONTO

TOUGH enough for any appliance

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PERMAGLO ENAMEL

TYPE: Alkyd-Amino Resin, Epoxy modified

COLOR: White (available in colors)

APPLICATION: Spray; manual, automatic, or electrostatic

BAKE: 20 min. at 325° or equivalent

GLOSS: High, 90 plus or minus 2

HIDING: Excellent, solid, one coat on steel

FLEXIBILITY: Good

ADHESION: Good to steel, primer, or spot repair

HARDNESS: H pencil

RESISTANCE: Excellent to detergents, humidity and salt spray

COLOR RETENTION: Good for light or overbake

RECOMMENDED FILM THICKNESS:
Over primer 1.2 mils Single coat 1.8 mils

USES: **Direct to steel:** Kitchen Cabinets, Refrigerators, Ironers. **Over Permagard Primer:** Laundry Equipment, Air Conditioners, Shower Stalls, Beverage Filling Machines and Dispensers, Undersink Cabinets, Dishwashers.

The Better the Finish, the Better the Buy

GRAND RAPIDS VARNISH CORPORATION

MAKERS OF THE FAMOUS Guardsman® FINISH AND Guardsman® CLEANING POLISH

GRAND RAPIDS, MICHIGAN

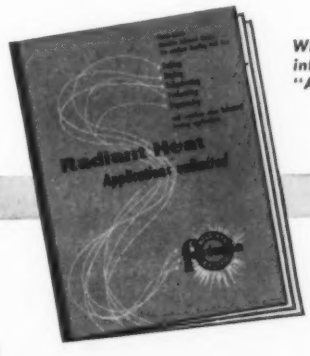
How to make short work of a long finishing job

Fast? A Fostoria Radiant Oven heats at the speed of light . . . requires no warm-up . . . bakes out a finish in a fraction of the time required by convection ovens.

You save space—cut costs to the nub—improve product quality. Read the Tinnerman case history at the right.

- **Cuts drying time 74%**
- **Tinnerman Products, Inc. makes fasteners —by the millions.**
- **Before Fostoria was called in, parts were finished in two fuel-fired batch ovens with great waste in time and motion.**
- **Two Fostoria Radiant Ovens cut drying time from 30 to 8 minutes—freed one worker for other tasks—improved work conditions.**

Savings like this may be possible in your operation. Call your Fostoria Sales Engineer for the complete story. There is no obligation!



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THE FOSTORIA PRESSED STEEL CORPORATION, Dept. 820 Fostoria, Ohio

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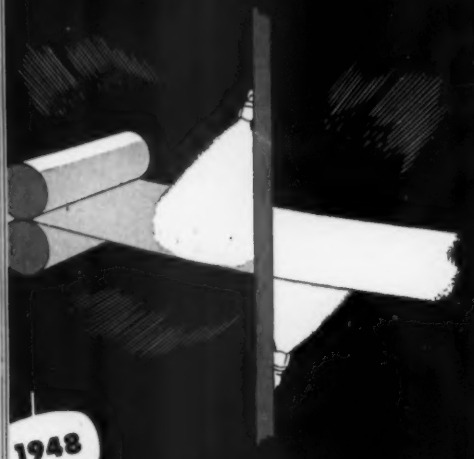
1920 1955

business grown big through SERVICE



1948

Ferro perfects continuous process for Porcelain enameling light-gauge steel in rolls.

1955

Success of new process and initial marketing programs points to big future for this patented process.

FERRO CORPORATION

cleveland · nashville · los angeles

IN CANADA: FERRO ENAMELS, LTD., OAKVILLE, ONT.

MEETINGS

TRIPLE PRODUCTION SHOW

Metalworking Machinery and Equipment Exposition, The Coliseum, Chicago, September 6-16.

Production Engineering Show, Navy Pier, Chicago, September 6-16.

Machine Tool Show, International Amphitheatre, Chicago, September 6-16.

ENAMELERS SHOP FORUM

Porcelain Enamel Institute, annual shop practice forum, Ohio State University, September 14-16.

PACKAGING-HANDLING SHOW

Society of Industrial Packaging and Materials Handling Engineers, annual packaging and materials handling show, Kingsbridge Armory, New York City, September 20-22.

PAINT FEDERATION MEETING

Federation of Paint and Varnish Production Clubs, annual meeting and show, Hotel Statler, New York City, October 3-5.

WORLD PLASTICS FAIR

World Plastics Fair and Trade Exposition, National Guard Armory, Exposition Park, Los Angeles, October 5-9.

LUBRICATION CONFERENCE

Joint Lubrication Conference of American Society of Lubrication Engineers and the American Society of Mechanical Engineers, Antlers Hotel, Indianapolis, October 10-12.

AGA CONVENTION

American Gas Association, annual meeting, Los Angeles, October 17-19.

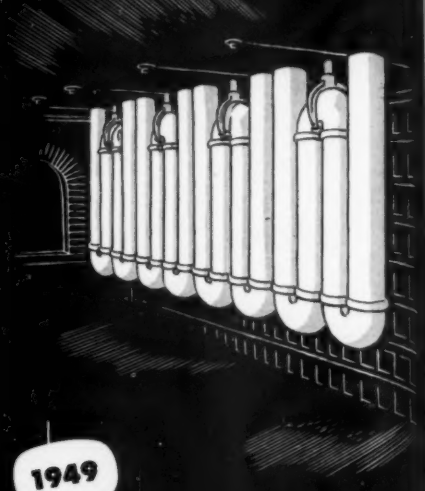
ENAMELERS ANNUAL MEETING

Porcelain Enamel Institute, annual meeting, The Greenbrier, White Sulphur Springs, W. Va., October 26-28.

FERRO

1920 1955

A business grown big through SERVI

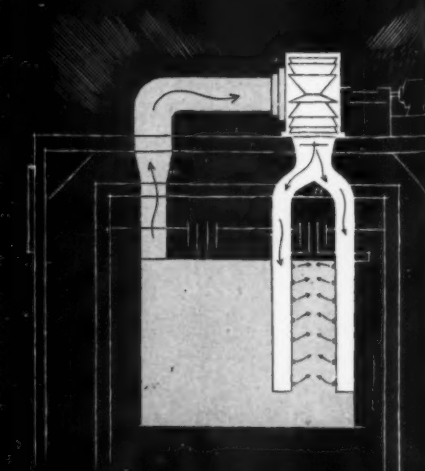


1949

Ferro introduces Center-Wall Alloy Tubes for more efficient heat of "U-type" P. E. furnaces.

1955

Ferro introduces convected air current system in preheat zone to improve enameling quality.



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IN CANADA: FERRO ENAMELS, LTD., OAKVILLE, O

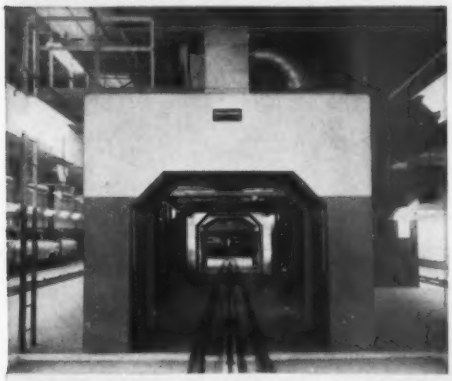
COMPLETE *Finishing* SYSTEMS

. . . for ENAMELS • LACQUER • PAINT • VARNISH

Interior of Mahon Pressurized Tack-Off Enclosure at entrance to Finish Coat Spray Booths. Spray Booth is visible in rear.

Mahon Dry-Sump, Down-Draft, Hydro-Filter Spray Booth with Remote Sludge Tank and Automatic Sludge Unloader.

Mahon Down-Draft Deadener Booth. Clean Filtered Air is supplied from above—Fumes are drawn down and out at bottom.



Mahon Dry-Off Oven with Cooling Tunnel at Exit End. Finish Baking Ovens are Similar with Multiple Controlled Heat Zones.

. . . the EXPERIENCE that goes into the PLANNING and ENGINEERING of MAHON EQUIPMENT is the item of GREATEST VALUE to YOU!

Over four thousand five hundred feet of conveyor carries automobile bodies through the various finishing operations in this Complete Mahon Single Production Line Finishing System.

WHY Do So MANY Manufacturers BUY Complete MAHON FINISHING SYSTEMS?

The answer to that question is very simple. In the first place, they want Mahon *KNOW-HOW*. In the second place, they want their entire finishing system planned, coordinated, engineered and installed by one responsible organization. In other words, they want one responsibility for final results—which are the quality and the cost of the finish on a product. Many things enter into these two end result items . . . most important are the operating efficiency and the operating cost of the finishing equipment. Most manufacturers have found that this is where the true worth of Mahon equipment shows up . . . it isn't built to a price, it is built to do a job. If you have a finishing problem, or are considering new finishing equipment, you, like thousands of other manufacturers, will find that Mahon engineers are better qualified to advise you on both methods and equipment requirements . . . and better qualified to do the all-important planning and engineering of equipment —which is the key to fine finishes at minimum cost. You will find also, that Mahon equipment is built better for more economical operation over a longer period of time—a factor to be weighed carefully when comparing initial cost figures. Mahon will do your complete job on one contract . . . undivided responsibility for the entire system insures proper coordination and safeguards you against complications which can upset your production schedules. See Mahon's Insert in Sweet's Plant Engineering File for information, or write for Catalog A-655.

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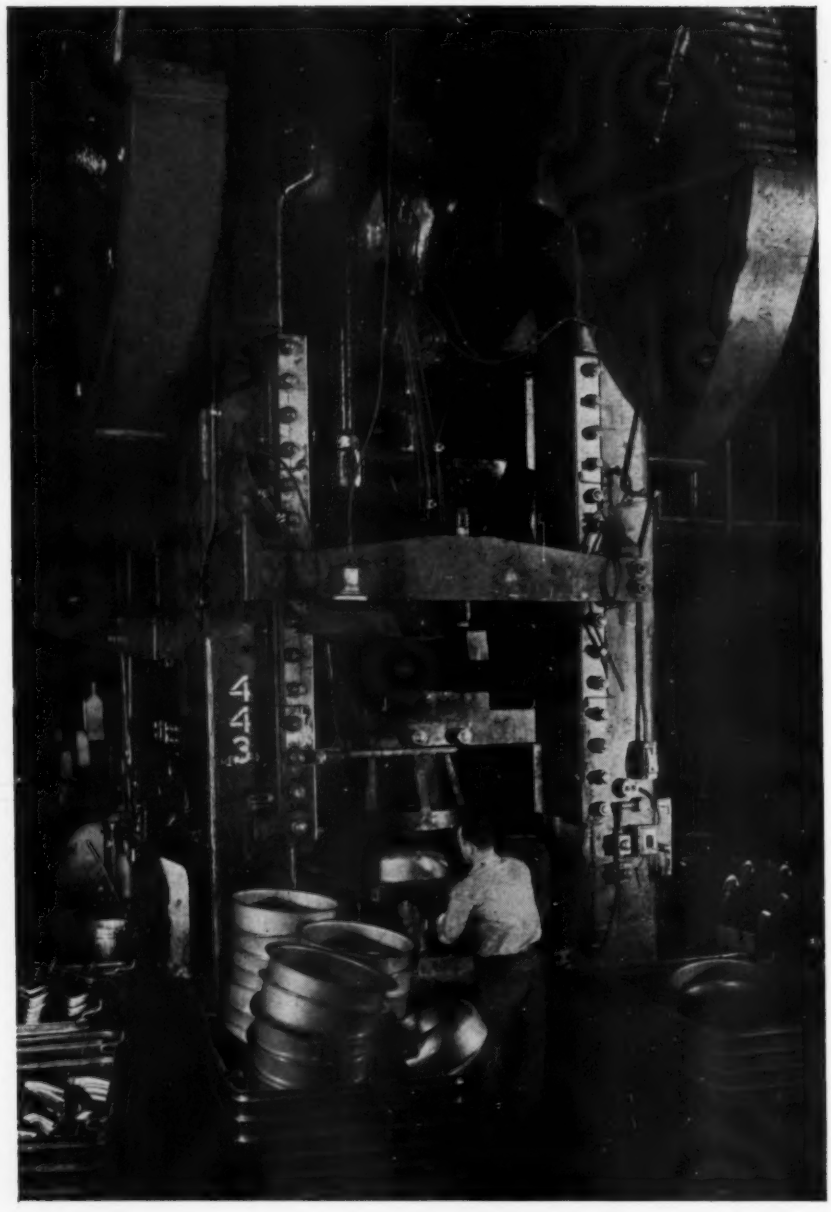
HOME OFFICE and PLANT, Detroit 34, Mich. • WESTERN SALES DIVISION, Chicago 4, Ill.

Engineers and Manufacturers of Complete Finishing Systems—including Metal Cleaning, Pickling, and Rust Proofing Equipment, Hydro-Filter Spray Booths, Dip and Flow Coaters, Filtered Air Supply Systems and Drying and Baking Ovens, Cooling Tunnels, Heat Treating and Quenching Equipment for Aluminum and Magnesium, and other Units of Special Production Equipment.

MAHON

engineered stamping expert at work!



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Here you will find technicians skilled in every production facility: deep drawing, shearing, spot welding, arc welding, brazing, pressing, degreasing, painting. All with years of experience and production knowledge. Why not put this same production team to work for *you?* For full details on our services, call, wire, or write!

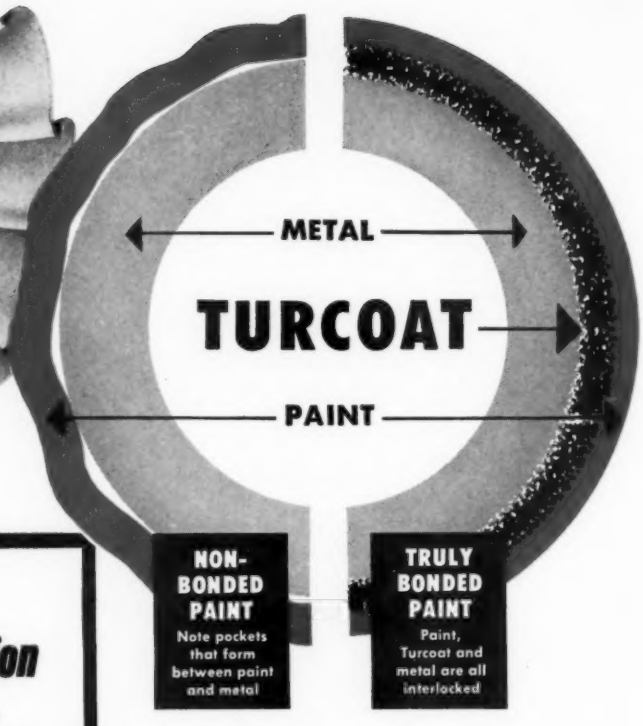
ACKERMANN MANUFACTURING COMPANY
WHEELING, WEST VIRGINIA

Steel Stamping does it BETTER—Ackermann-Wheeling does it BEST!

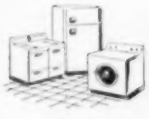
THE finish spotlight

An eye-level Norge oven built into a Beauty Queen cabinet offers a homemaker the convenience of built-ins without the expense of remodeling walls. The cabinet containing the oven can be set apart from other units anywhere in the kitchen to make better use of available space.

Your SEAL of Assurance



For Permanent Paint Adhesion



1 AS A BOND FOR PAINT
Turcoat materials simultaneously clean and slightly etch the metal surface, depositing a toothy coating which grips paint uniformly and permanently.

2 AS A BOND FOR OTHER ORGANIC FINISHES
Turcoat materials are vital in mass production of small parts, providing a surface which will absorb protective materials, eliminating clogging, sticking and general messiness.

3 ANTI-FRICTION COATING
Turcoat materials form an anti-friction cushion between moving parts, thus protecting fine metal surfaces from galling. Particularly useful for "break-in."

A seal of assurance... a *permanent paint* seal you can absolutely rely on, is yours simply by using one of the complete line of Turcoat phosphating materials as a bond for your organic finishing.

Turcoat materials slash rejects... insure ready acceptance of your product at a profitable level. They are *low* in price, but *high* in chemical strength ... always affording good "mileage" and long tank life. Turcoat baths are easy to control. They do not require frequent de-sludging or tinkering with corrective agents. There is no interruption in production... no costly clean-up or reheating.

If you have a paint adhesion problem, chances are you'll find the right solution in the Turcoat line. And you will realize why, when *permanent paint adhesion* is required, America's leading metal finishing plants turn to Turco... first!

For Cleaning or Metal Conditioning Problems...Turn to Turco First!

Hot or Cold Immersion

Spray Washing

Steam Cleaning

Solvent Spray

Flaw Location

Paint Removing

Write for FREE Descriptive Booklet. Get the full story on phosphating, along with Turco's phosphating reference chart... free!

67 SPECIALIZED SERVICE CENTERS. From coast-to-coast and border-to-border Turco specialists and Turco warehouses are in most principal cities. Consult your local classified telephone book for the one nearest you.

TURCO

TURCO PRODUCTS, INC.
Chemical Processing Compounds
6135 So. Central Ave., Los Angeles 1, Calif.
Factories: Newark, Chicago, Houston, Los Angeles

all-right, All-Brite

Gentlemen:

In your June issue you carried our story headed "New Plant — from the Ground Up — for All-Brite Lighting Fixtures," and we want to take this opportunity to compliment you and thank you for the excellent work you have done. We had a number of calls and letters on this article and are wondering if it would be possible to get approximately 200 reprints of this story.

R. H. Shaffer
Works Manager
Fluorescent Fixtures of California
South San Francisco, California

---

built-in appliances

Gentlemen:

I read with a great deal of interest the July issue of *finish*, particularly the part on built-in appliances, and would appreciate it very much if you would add my name to the mailing list for your magazine.

S. J. Williams
Manager, Product Research
Seeger Refrigerator Company
Evansville, Indiana

---

cover to cover

Gentlemen:

From our particular standpoint as contract sheet metal manufacturers, and particularly our close association with the appliance industry, I have always considered *finish* tops in the field. In fact, it is the only magazine I regularly read from cover to cover because of the interesting and informative material.

E. C. Koellner
Sales Manager
Geuder, Paeschke & Frey Co.
Milwaukee, Wisconsin

---

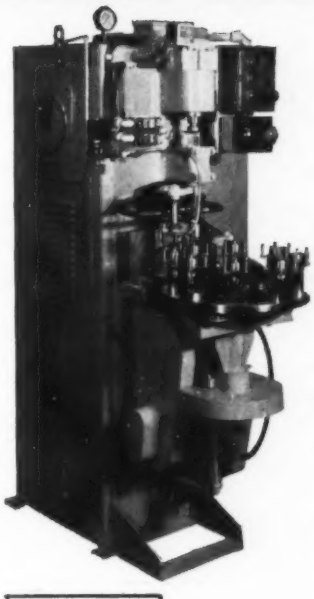
clean paint room air supply

Gentlemen:

We have just finished reading your article entitled "How Clean Is Your Paint Room Air Supply" in the July issue of *finish*, and would like to learn more about the filtering system which the John Bean Company installed.

H. R. Smithson
Chief Engineer
Esco Cabinet Co.
West Chester, Pa.

Source for additional information has been forwarded to you. — Eds.



To get more efficient assembly of an end head on a fractional horsepower motor, a leading automotive parts manufacturer came to Federal. The result — a standard Federal Bench Type Projection Welder with a special 8 station dial feed operated through a Geneva motion drive that completes 1600 assemblies per hour.

Federal uses a Reeves drive arrangement operating through a gear box to permit flexibility of adjustment of indexing rate. The die slide is spring loaded to insure identical weld force at each station. The manufacturer finds this welder gives a more uniform motor end head, in greater quantities, at reduced costs.

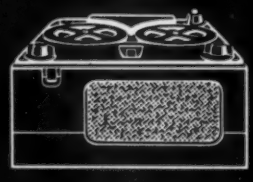
This is another example of how Federal's resistance welding "know how" is paying dividends to one of America's leading industrial concerns. Why not, when next you're considering welding, call *Federal — First in Resistance Welding.*

Federal® WELDERS
Warco® PRESSES

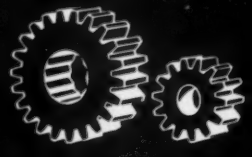
THE FEDERAL MACHINE & WELDER COMPANY
WARREN, OHIO

PREVENT *Rust* *with* MACCO BLUCOAT

the amazing between-operation rust proofing solution



RECORDER precision parts are being given the Macco Blucoat Rust Preventive treatment by one of the nation's leading electronic manufacturers.



GEARS cut, ground and tempered are treated with Blucoat to prevent rust during storage, shipping and assembly.

CARBURETOR bodies and large engine castings being treated with Macco Blucoat to prevent rust after machining and during storage.

AUTO bodies of one of the world's largest body manufacturers are given the Blucoat treatment to prevent rust before painting.

***MACCO CASE HISTORY**

Blucoat is the almost unbelievably efficient and time-tested rust preventive used by leading metal processors and fabricating manufacturers the country over. They endorse its use as the only practical method of preventing rust between production operations and assembly —and during interplant transportation and storage.

5 REASONS FOR BLUCOAT'S NATIONAL ACCEPTANCE:

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2. Blucoat is adaptable to an almost unlimited variety of applications and conditions.
3. Blucoat's powerful rust inhibitor works equally well on steel, cast iron, forgings or die castings.
4. Blucoat leaves no oily film—adheres better to metal—collects less dust, chips, etc.
5. Blucoat has withstood perfectly a salt spray test of more than 80 hours. Vastly superior to soluble oil, it contains no poisonous elements. No alcohol, making it exceptionally stable.

For the prevention of rust, Blucoat positively has no equal. Whether the product be the finest of automobile bodies or simply bale tie-wires, Blucoat's versatility makes it most indispensable for any metal processing plant.

Write today or call a Macco sales engineer. Phone Prescott 9-0800, Chicago.

*Actual Case History available on request.

MACCO PRODUCTS COMPANY

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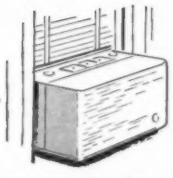

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In developing finishes for the International Harvester air conditioner, Glidden formulators faced a double problem . . . the inside and the outside.

The room side of the unit is protected by one type of Glidden NUBELITE* against damage by impact, abrasion and humidity. The weather or exterior side receives protection from rain and sun by a second type of NUBELITE formulation and a totally different finishing schedule.

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We can and did provide a highly satisfactory frit for this customer, the result of "KNOW HOW." Our Ceramic Engineers have the tremendous advantage of day in and day out contact in our own large enameling plant where through the years we have met and conquered almost every conceivable enameling problem.

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ING-RICH
FRIT
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OFFICES, LABORATORY AND PLANT • FRANKFORT, INDIANA

THE finish LINE

A seven-billion-dollar gravy train— needs the attention of every reader of this publication who pays taxes (and who doesn't).

Unquestionably, you have been reading in the daily press news reports concerning the recommendations to Congress by the Hoover Commission for a better business organization for many federal departments, bureaus and agencies. Some 200 leading business and professional men have conducted studies for this Commission to determine the sources and causes of waste and inefficiency in the Federal government. The results of these studies have been translated into recommendations to Congress by the Hoover Commission — recommendations for a reduction in waste without reduction in efficiency.

All waste and inefficiency must result in higher Federal taxes, some part of which must be paid by each individual who reads this message. We believe, therefore, that it is high time that each of us take pen in hand or address a dictating machine to send an individual letter to each of our representatives in Congress urging careful study and favorable action on the Hoover Commission recommendations.

Hoover Commission uncovers unparalleled waste of money

The studies of the Commission have uncovered unparalleled waste of the taxpayers' money, in many cases without useful return. These wastes will continue and taxes will increase unless men in offices and men in the plants toss aside the natural reticence to writing letters to government representatives and take some early action.

It is estimated that some $7,000,000,000 (seven billion dollars) can be subtracted from the cost of government if the recommendations in the Hoover reports are put into effect. It is not expected that the Congress will take favorable action unless the voters — the people from whom they must seek re-election — express themselves.

It is natural that opposition to many of the recommendations is developing in Washington, especially where some pet project might get the ax. You can bank on it that there is plenty of pressure by groups with individual interests. This can only be counterbalanced by an expression of interest on the part of the individual taxpayer.

It seems natural that all of us would like to see streamlined government with reduced taxes in cases where this streamlining can be done without jeopardizing *good* government. Reports indicate, however, that little of this feeling has been transmitted to Congress and, as a result, it is always possible that the fine work of the Hoover Commission may never result in the necessary action to take advantage of its findings.

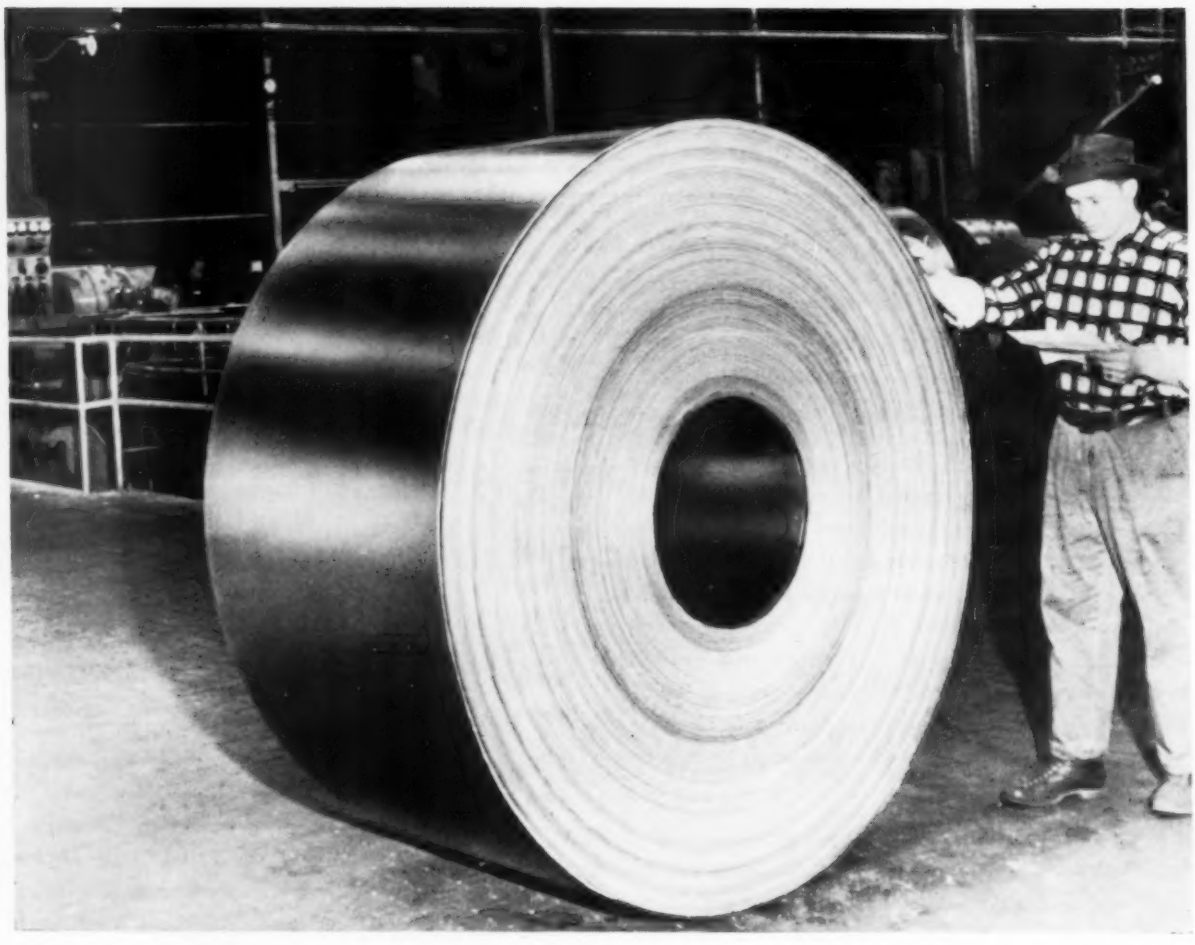
You owe it to yourself to write today urging Congress to adopt the recommendations of the Hoover Commission.

This publication never has and never will concern itself with "politics" as such. Our editors are trained to search out and develop editorial material of practical use to management and plant men in the appliance and metal products manufacturing field. In this instance, we are not concerned with political aspects but with the general welfare of all taxpayers who may choose to read this page.

Dana Chase

EDITOR AND PUBLISHER

Coil weight is no problem with us on cold rolled sheets and strip



78" diameter coil of cold rolled sheet steel produced at our Indiana Harbor Works, East Chicago, Indiana.

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The key to contract manufacturing —diversification

this company fabricates and finishes (organic and ceramic) or will engineer and build a complete finished appliance or other metal products

by J. J. Boehler • DIVISION MANAGER, HEINTZ MANUFACTURING COMPANY, PHILADELPHIA.

finish

Diversification has been one of the motivating factors in the growth of Heintz Manufacturing Company, Philadelphia, since its modest beginning in 1922.

Founded to do metal stamping and fabrication, the intervening years have recorded continuing growth in both manpower and facilities, as well as expansion into numerous phases of metal working and finishing operations.

Heintz produces, under contract for manufacturers, such diversified lines as jet engine and automotive components, television cabinets, refrigerator components, ordnance, plumbing fixtures, marine closures and components, automatic clothes dryers, cabinets and porcelain sinks, agricultural equipment, automatic glass-lined water heaters, specialties, dies, jigs and fixtures, and numerous other items.

With 1,000,000 square feet of operational space, its plant buildings house massive presses for forming and stamping, precision machines that shape metals to exacting tolerances, miles of conveyor systems and material handling equipment for streamlining mass production, as well as various metallurgical and chemical laboratories and a complete engineering service.

Research and development

Supplementing the mass production of metal products within the Heintz plant is an extensive Research and Development division. This service unit is devoted to fabrication, for test purposes, of units and new products not yet in production. Development generally follows the pattern — from idea to design to finished product.

An automatic submerged arc welding machine for welding longitudinal seam on shell for water heater at the Heintz plant.

Set of true circle rolls for rolling steel sheets into tank shells.

Grinding the longitudinal seam on inside of tank for glass lining

These highly integrated manufacturing facilities are utilized by industrial and merchandising organizations. One of the country's major appliance organizations is making use of these facilities for producing a glass-lined automatic water heater entirely within the Heintz plant.

Manufacture of the heaters calls for a high degree of skill and diverse equipment — advanced arc welding, glass-lining, hydrostatic testing, insulating, painting, in addition to deep drawing and allied operations. All are balanced against stringent elements of cost — important considerations for those who must merchandise the products.

Manufacturing steps for a typical end-product

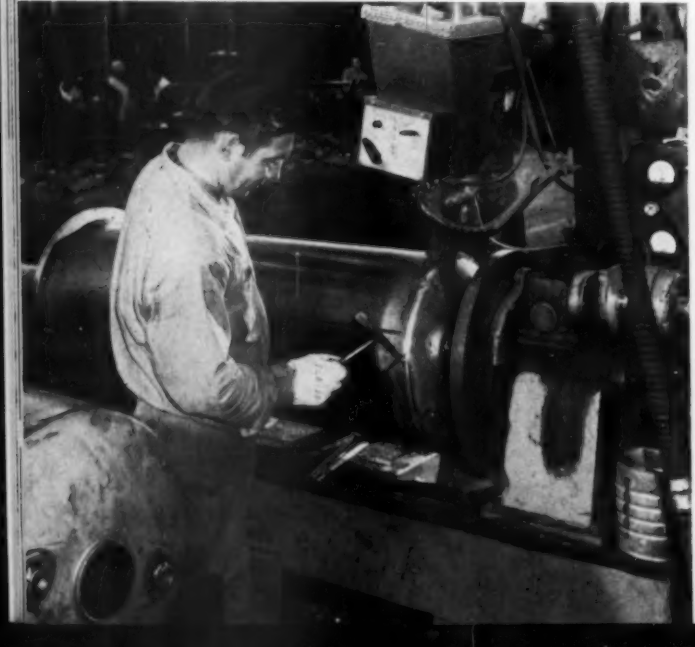
In the manufacture of glass-lined water heaters the first consideration is the design. This is influenced by such factors as the cathodic protection, the external or internal flue construction, the off-set or center flue construction and whether the finished product is to be gas or oil fired.

Following the decision as to how heat is to be applied to water, pressure requirements are then determined which dictate the gauge of metal to be used in the construction of the tank. Design of the attachments for piping and fabrication prior to glass lining are determined by the enameling requirements.

At the Heintz plant, steel sheets are purchased in a size that will give two shells from one sheet. This sheet is squared to size. A press operation follows which pierces the control and drain cock openings simultaneously. The sheet is then passed through a set of true circle rolls.

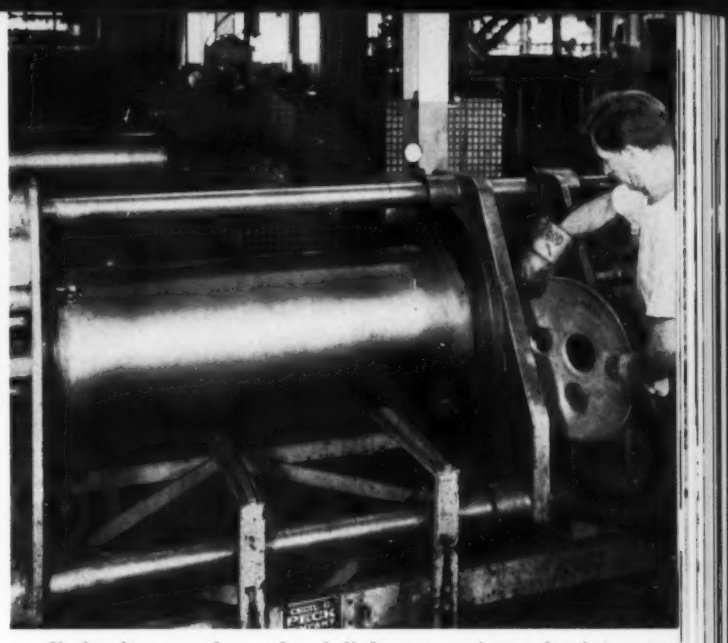
Following this operation, all shells are washed in an alkali cleaner bath

Automatic submerged arc welding machine welds head to shell.



Testing tank and head assembly for leaks prior to glass lining

Welding the drain and control fittings to the tank shell.



Hydraulic ram flares the shell bottom and sets head into tan

to remove any grease or oil. This is essential in order to obtain an oil-free surface for welding.

Submerged arc welding used extensively

The next step is the welding of the longitudinal seam of the shell. This operation is performed on an automatic submerged arc welder, penetrating the seam 100 per cent. Following the seam welding, the inside seam is ground smooth to remove all rough edges and high welds. This is necessary to insure a smooth seam for glass-lining.

The cylinder is then placed over a mandrel on another automatic submerged arc welding machine which welds the drain cock and control fittings individually.

The shell is then placed into a hydraulic ram which automatically sets the head into the shell and flares the bottom of the shell. This flaring is done to retain the concentricity of the shell during the glass-lining operation and to enable the proper fit to the bottom head.

In the next step, the shell with the head is placed into another automatic submerged arc welding machine which welds the head to the shell. An air test is then applied to the completed head and shell assembly with 40 pounds pressure to assure a 100 per cent leak-proof tank at this point. Two ears are then welded to the tank to permit hanging of the tank during the glass-lining operation. This unit is now complete insofar as fabrication is concerned.

At Heintz, flues are constructed from welded seamless tubing cut to the required length. The tubing is washed to remove any oil or grease and is then inserted into the bottom head in a fixture, automatically sub-

Hydraulic press for assembling glass-lined flue and bottom assembly to the glass-lined tank and head assembly.

Submerged arc welding machine for welding flue and bottom assembly to the tank assembly after glass lining.

Welding the flue to the head in the tank assembly after both parts have been glass lined.

Inspection testing the completed glass-lined assembly for leaks.

merged arc welded and then tested 100 per cent for leaks. This procedure is followed in the same manner for both center or off-set flues.

The heads are die drawn stampings to which three fittings (hot and cold and anode) are submerged arc welded.

Steel grit blasting used for parts to be glass-lined

After the fabrication of the head and shell as one unit and the flue and bottom as another unit, it is necessary that these metal surfaces be prepared for glass lining. Because of the type shell used on these parts, steel grit blasting has been found preferable.

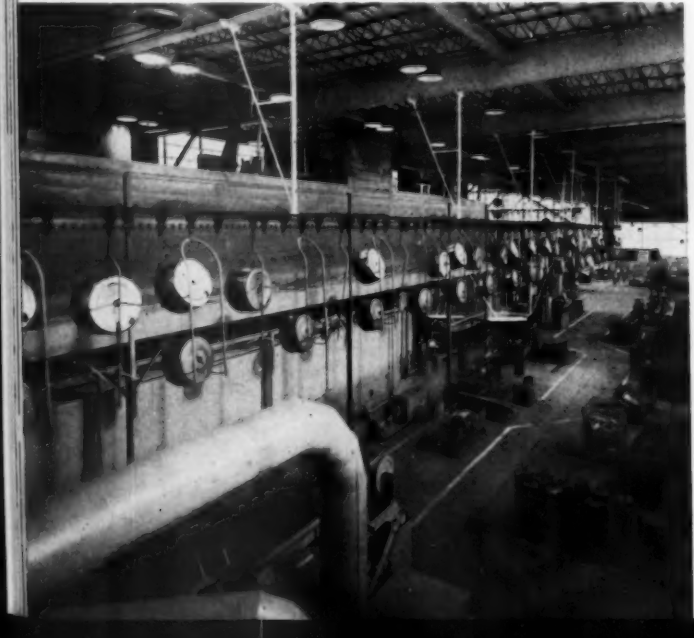
The special steel grit blasting equipment in use will clean one tank and one flue simultaneously. In this cleaning operation, it is necessary that all scale and rust be completely removed from all areas that are to be glass-lined. The grit blasting also slightly etches these surfaces and is conducive to promoting a bond of the glass to the steel.

Frit for the glass lining as purchased from commercial manufacturers is milled, control-checked and placed in pressure tanks, ready for application by means of conventional spray equipment. Application may be made either automatically or by hand.

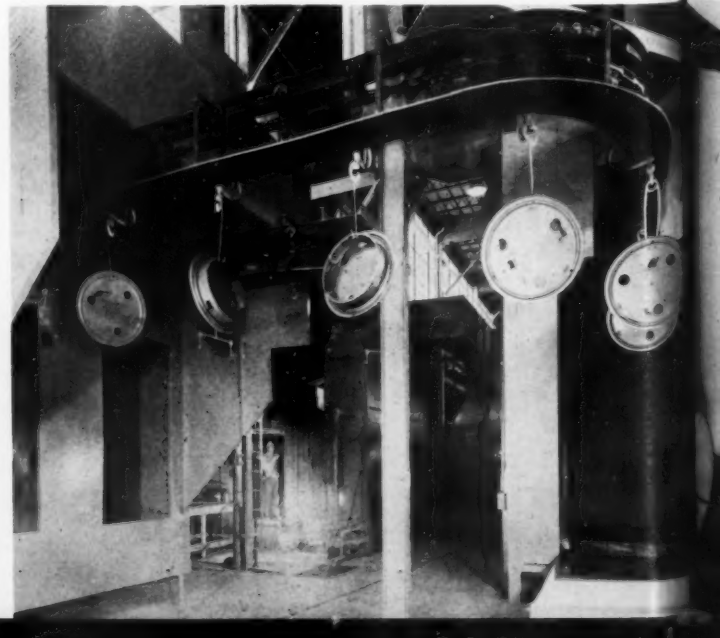
Rotating equipment for material application

The glass-lining is applied to the tanks by means of a tank rotating mechanism, a battery of automatic spray guns and a horizontal reciprocating unit to which the guns are attached. As the tank rotates, the guns move in and out on the reciprocating unit. This provides complete cover-

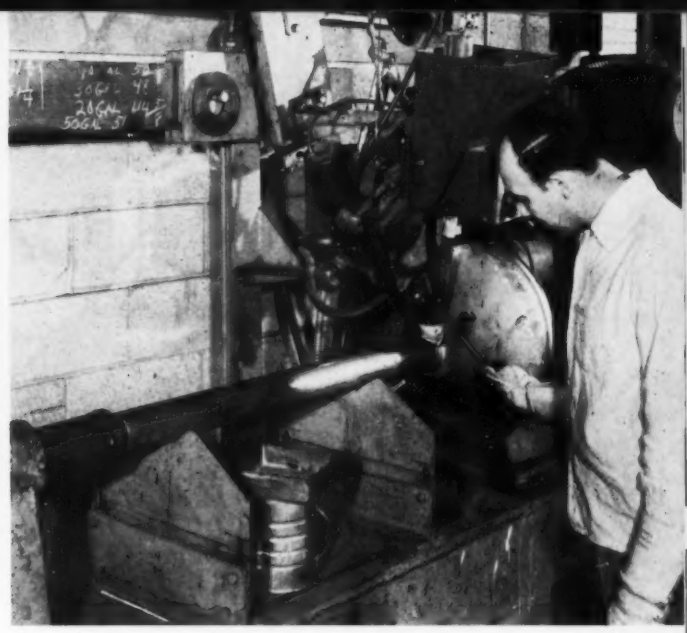
Spray wash and baking oven for synthetic enameling, with washing machine tub service conveyor in foreground.



Water heater bases move out of spray wash phosphatizing machine and enter the dry-off ovens.



Fixture for applying skirt to tank and arc welding in place.



Automatic submerged arc welding flue to bottom assembly.

age at a specific thickness of glass. The flues are sprayed while revolving on an automatic turn-table.

All glass lining is a one coat application controlled to the total thickness of .006″ on both shells and flues.

Following the spraying operation, the parts are run through the dryer at approximately 350°F. They are then hung on a furnace chain and are fired at approximately 1600°F. for a period of seven to ten minutes, depending upon the thickness of the metal in the parts. After firing, these parts receive 100 per cent inspection.

After the glass-lining operation, the flue and bottom assembly is inserted into the shell and positioned on a hydraulic ram. Two welding operations are required on this part — the flue to the head and the bottom to the shell. Automatic submerged arc welding is used in both cases.

Complete assembly then follows and all units receive 100 per cent air-testing. One out of every 25 tanks so completed is hydrostatically tested and examined for possible defects.

Materials from competitive frit companies are constantly tested to assure the best possible results. In the formulation of the glass for hot water heaters, it is necessary that materials will meet acid, alkali and other such tests as will approximate the various water conditions to which the tanks will be subjected.

Special conveyorized handling during manufacture and assembly is utilized to prevent fracture of the glass lining.

Three-stage cleaning and phosphatizing system

Heintz utilizes a three-stage cleaning and phosphatizing system to pre-

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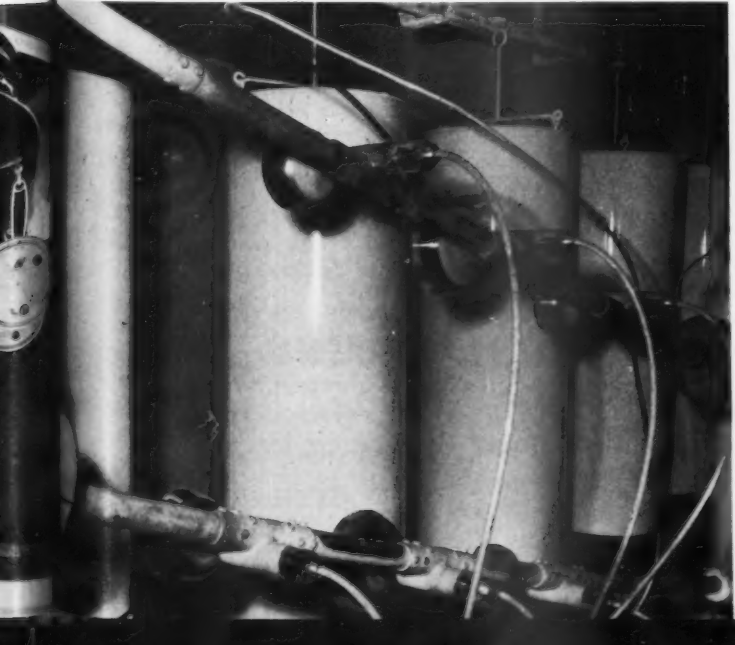
Electrostatic spraying synthetic enamel to water heater exteriors.



Overhead conveyors carry outer tank casings from baking ovens to the final assembly line.

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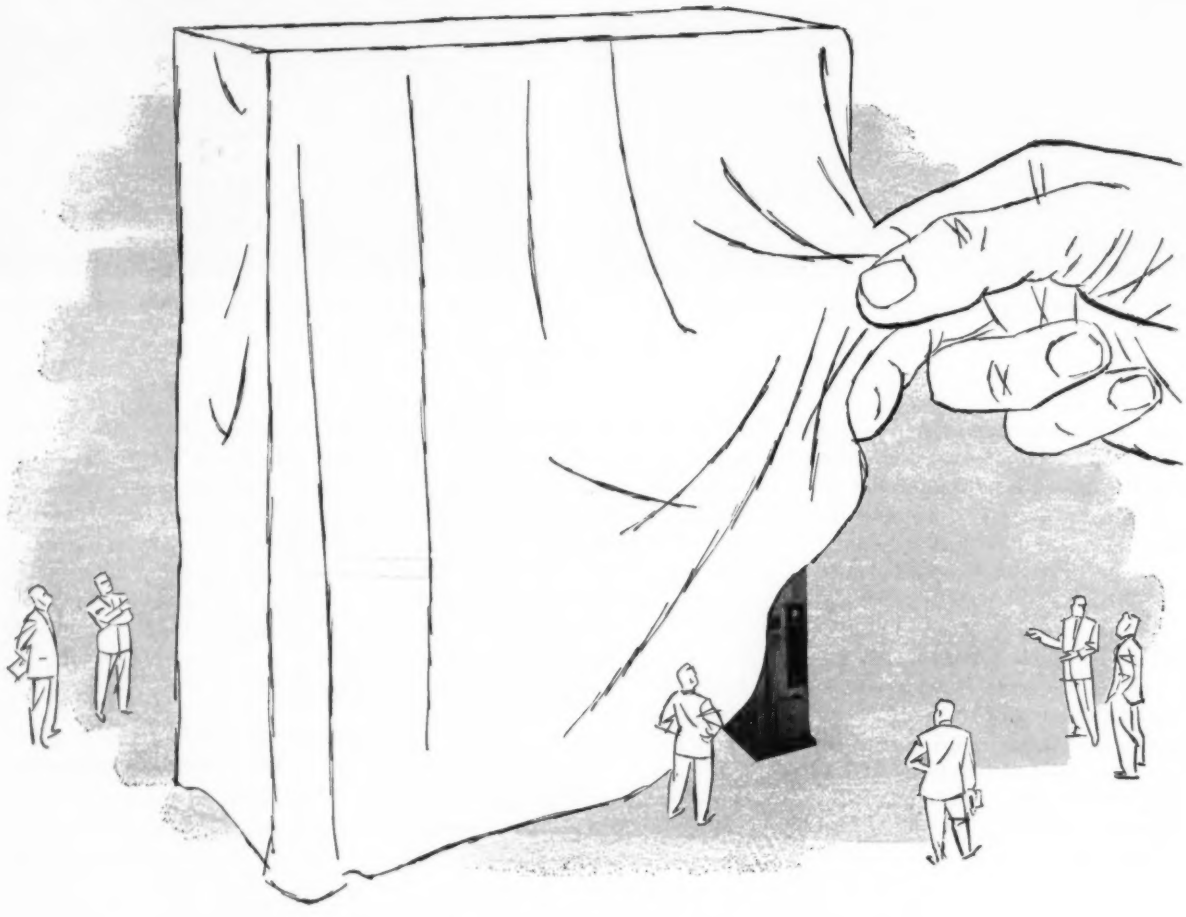

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While in Chicago, during the Machine Tool Show, be sure to visit the Verson plant. Verson presses will be in operation for your examination in our new Research, Development and Exhibit Center.

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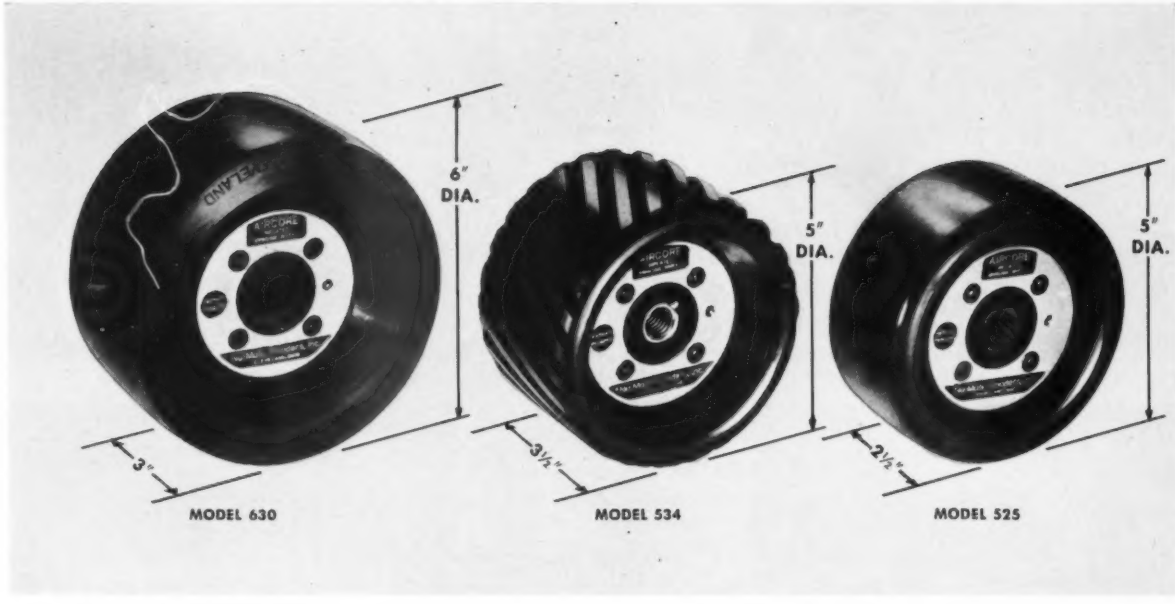


Interchangeable Aircore Grinding Wheels now available in three sizes

Shown above are three Aircore Inflated Grinding Wheels that feature interchangeable contact drums. All three models are available with plain or serrated contact faces and can be used with all standard drive methods.

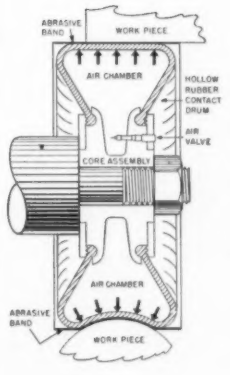
The core assembly is identical for all three models. Complete change-over from one size contact drum to another size takes less than five minutes.

The extremely light weight of these models helps reduce operator fatigue. The Model 534 weighs only 15 ounces.

A gradual "feather" blend instead of a hard edge cut is produced by Aircore's new sidewall and rounded edge construction.

Any durometer hardness can be duplicated simply by varying air pressure in the air chamber.

All the facts about Aircore Grinding Wheels are yours for the asking. Write today for Aircore Bulletin No. 9.



The Nu-Matic Air-Inflated Grinding Wheel is built like an auto tire — flattens out at point of contact — contours to work surface.

Here you see the large grinding area that an Aircore gives on flat surfaces. A sheet of glass is pushed against an Aircore wheel that has been inflated to 3 pounds pressure.

NU-MATIC GRINDERS, INC.
8224 Carnegie Ave. Cleveland 3, Ohio

Surface protection for stainless steel

a method of protecting stainless steel surfaces during fabrication and assembly of refrigerated beer and soft drink dispensing units

finish

Adoption of a thin pressure-sensitive tape to protect stainless steel during fabrication is helping the R. Perlick Brass Co., of Milwaukee, up production while cutting damage losses at the same time.

Plant officials attribute both improvements to "smoother" handling of stainless steel sheets and virtual elimination of waste motion in moving the sheets along the assembly line.

They credit the achievements to the tape, which is used to protect the sheeting during the making of refrigerated beer and soft drink dispensing units for stores, restaurants, clubs and similar establishments.

First used by the firm in early 1950, protective paper tape is designed to protect finished metal surfaces against abrasion, die marks and scratching during handling.

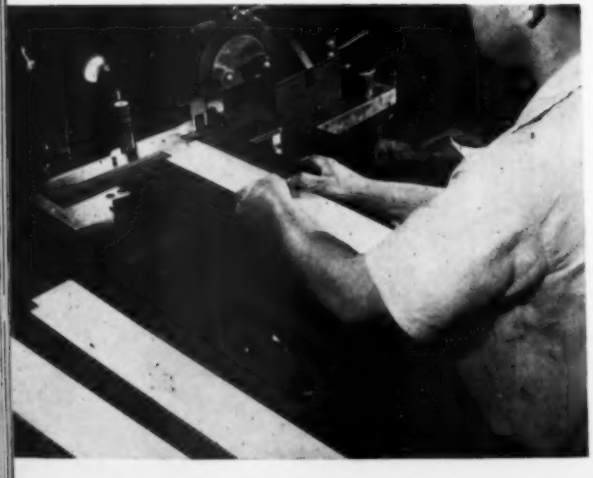
"This taping method", the firm's Geo. J. Kannenberg explained, "is in our estimation the best and least expensive method available today for protecting stainless steel sheets.

"Prior to its use", he reported, "scratches and other blemishes on our finished cabinets were an entirely too common occurrence, and any effort to remove them always changed

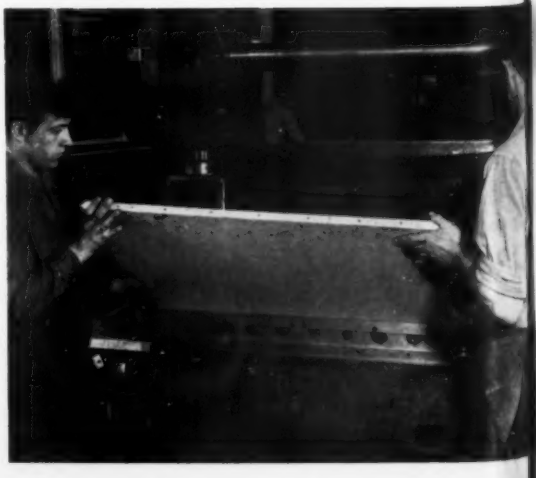
Left: Initial protective step is taken in the stock room where tape is applied over the finished surfaces.

Right: From the stock room the pieces go to the shear room where they are cut and trimmed to correct size. Note how tape protects surface during handling and cutting.

PHOTOS COURTESY MINNESOTA MINING & MANUFACTURING CO.



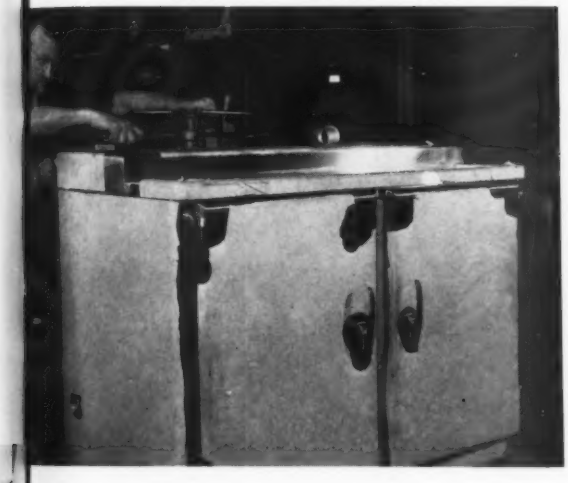
Left: During the stamping operation the tape continues to protect the finished surfaces.



Right: Forming a tape-protected end-panel that will eventually become a part of a stainless steel bottle box.

Left: After forming, all exposed joints are heli-arc welded — operator is shown welding joints of drip pan panels. Tape continued to protect all unexposed surfaces.

Right: After initial rough grinding, welds of drip pan panels are blended in with an air-inflated grinder.



Left: Following initial assembly, miscellaneous parts such as sleeves, fountains, etc. are added. Note how tape still continues to protect most surfaces of this stainless steel beer dispensing cabinet.

Right: Adding the electrical and refrigeration components to the nearly-completed cabinets.

the appearance of the cabinet's finish."

At that time, the stainless steel finishes were virtually unprotected except for thin sheets of kraft paper, which were sandwiched between the individual steel sheets at the mill before shipment to the Perlick plant. The paper proved of value during storage, but became a hindrance during handling.

Paper sheets cause double handling

The main disadvantage encountered was "double handling".

At each step in making a stainless steel cabinet the workmen had to remove the paper cover, do the fabrication work, and then replace the paper. During all this, the paper often tore or wrinkled or blew away.

In addition, the paper protective covers could no longer be used, once the stainless steel pieces were ready for final assembly. Between assembly and crating, the finished stainless steel surface of a completed cabinet was left totally unprotected.

Pre-shipment protection

"This absolute lack of pre-shipping protection," Kannenberg stated, "was corrected when we switched to the protective tape. Now we're able to provide full protection to the finishes all the way up to crating time."

Today two workers apply wide strips of the protective pressure-sensitive tape to the individual sheets of No. 4 finish stainless steel as they are unpacked in the stock room. Application of the tape and the procedure of smoothing it to the surface takes only a few seconds per sheet. The sheets are then trucked to the shear room where they are trimmed to the exact size needed for the subsequent fabricating steps.

During fabrication of a single unit, more than a dozen workers handle the tape-protected steel parts before the finished product evolves. Then the tape is merely peeled off; the surfaces wiped clean and polished; and the cabinet crated for shipment.

Between the time the tape is applied and crating, however, the various fabricating steps for completion of a single unit include: shearing, notching, punching, forming, welding, weld-grinding and buffing, refrigeration, and removal of the protective tape.

According to Kannenberg, the tape protects the steel's finish from normal rough handling throughout all production stages even though portions of it are torn or worn off during fabrication.

"The net result," he explained, "is that our steel is so well protected that not even hairline scratches show up in the finished product."

The tape used by the firm is 5½ mils thick (purchased in 100 yard rolls in 36″ and 48″ widths) and is designed for protecting all metal surfaces except copper or anodized aluminum.

WASHING MACHINE TUB

Seamless Drawn
Vitreous Enameled
Height.....14¼"
Diameter.....22"

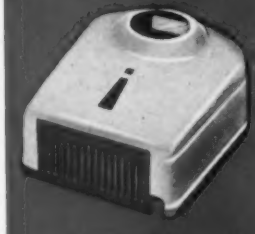
BASE FOR SWIVEL CHAIR

Seamless Drawn Carbon Steel
Length 25" Height 4"

MIXING BOWL

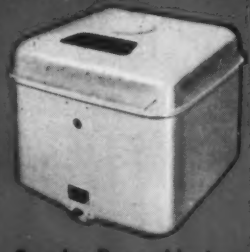
Seamless Drawn Carbon Steel
Welded Brackets
Diameter.....14"
Height.....10½"

COMMERCIAL HAND DRYER



Seamless Drawn
Vitreous Enameled
Length.....12"
Width.....10½"
Height.....6¼"

TUB AND COVER FOR
PORTABLE DISHWASHER

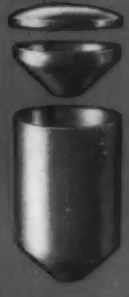


Seamless Drawn Aluminum
Baked Enamel Finish
Height of Tub....11"
Length and Width.17"

AMMUNITION BOX
(U. S. Ordnance)

Carbon Steel—Spray Painted
Length.....10"
Height.....7"
Width.....3⅜"

COVER, FUNNEL AND TANK
FOR SOAP DISPENSER UNIT

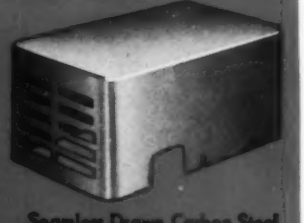


Seamless Drawn Brass
Height of Tank....7"
Dia. of Tank....4¾"

DEEP FAT
FRYER POT

Seamless Drawn Stainless Steel
Height.....12"
Length and Width..17⅛"

COVER FOR OIL
BURNER UNIT



Seamless Drawn Carbon Steel
Height 5½" Length 12½"
Width.....7½"

it's our business
to make stampings like these
for your business

G. P. & F.

meets your needs for large and medium size seamless stampings PLUS complete finishing and assembly facilities

Shown here are just a few of the hundreds of different kinds of seamless drawn stampings we have manufactured for America's foremost companies. We made them **economically,** we made them **right,** we made them **on time.**

Our services do not end with stamping. We have complete facilities for finishing and assemblying, galvanizing, spray finishing, vitreous enameling, welding. If desired, we even package your products and ship to your customers!

Over 1000 skilled people . . . 293 deep draw and stamping presses . . . 97 welding machines . . . backed by 75 years' experience . . . are at your beck and call. Get full details . . . now!

Write for your copy of booklet—"Science and Skill in Sheet Metals." It illustrates many jobs produced for G. P. & F. customers . . . gives complete data on our facilities.

GP&F DIAMOND ANNIVERSARY 1881 1956

GEUDER, PAESCHKE & FREY CO., 1605 W. ST. PAUL AVE., MILWAUKEE 1, WISCONSIN

The rapid determination of cadmium in plating solutions

by Frank J. Versagi • SENIOR ANALYTICAL CHEMIST, MUELLER BRASS COMPANY, PORT HURON, MICHIGAN.

THE classic determination of cadmium by electro-deposition is relatively time-consuming. It becomes even more disadvantageous when several baths must be run concurrently. The recommended titration with ethylenediamine-tetracetate, while rapid, suffers from the disadvantages of an indistinct end point, making it difficult for different operators to duplicate results on the same sample.

The polarographic method used in this laboratory is rapid and simple, requiring no standard solutions or separations of any kind.

Apparatus and solutions

A recording polarograph was used to investigate the method. However, in routine analysis it is used as a manual instrument, and any model polarograph will be adequate.

Gelatin — 0.2g of gelatin in 100 ml of warm distilled water. The gelatin solution must never be more than 5 days old.

Method

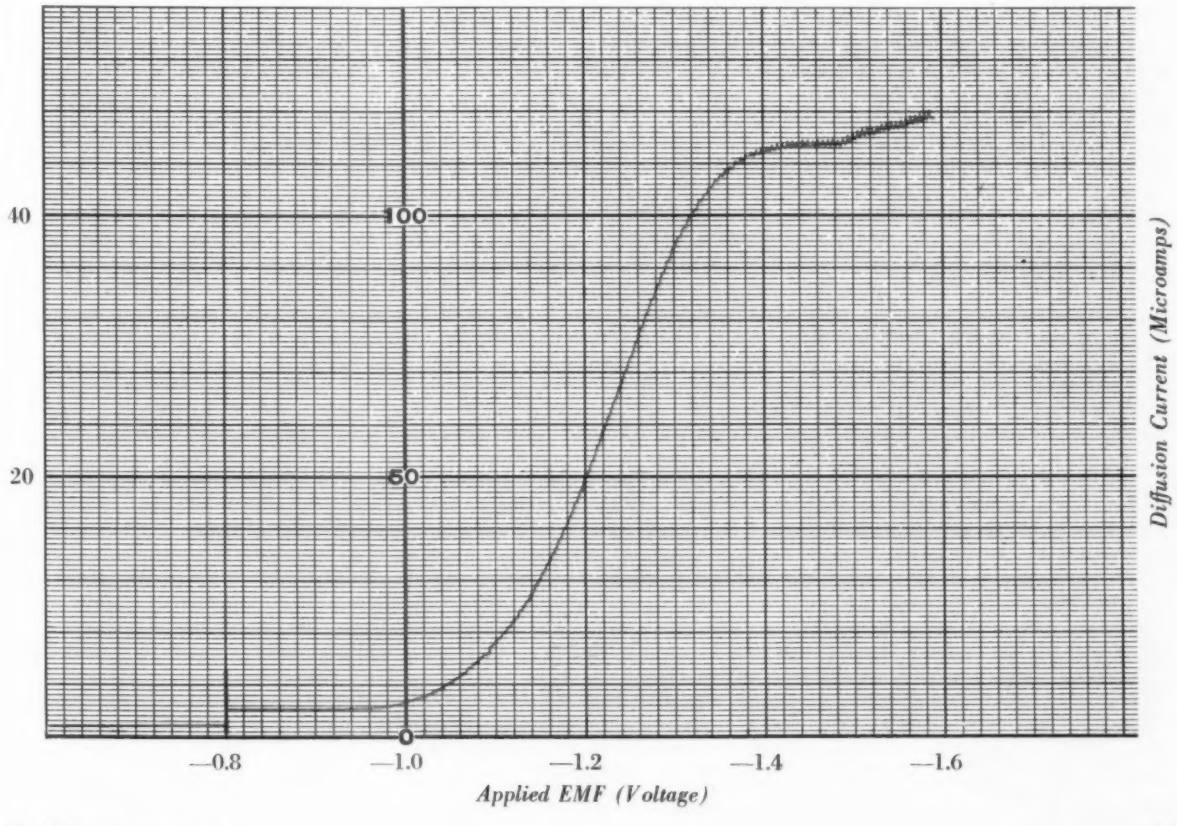
1. Pipet 5 ml of plating solution into a 50 ml Nessler tube.

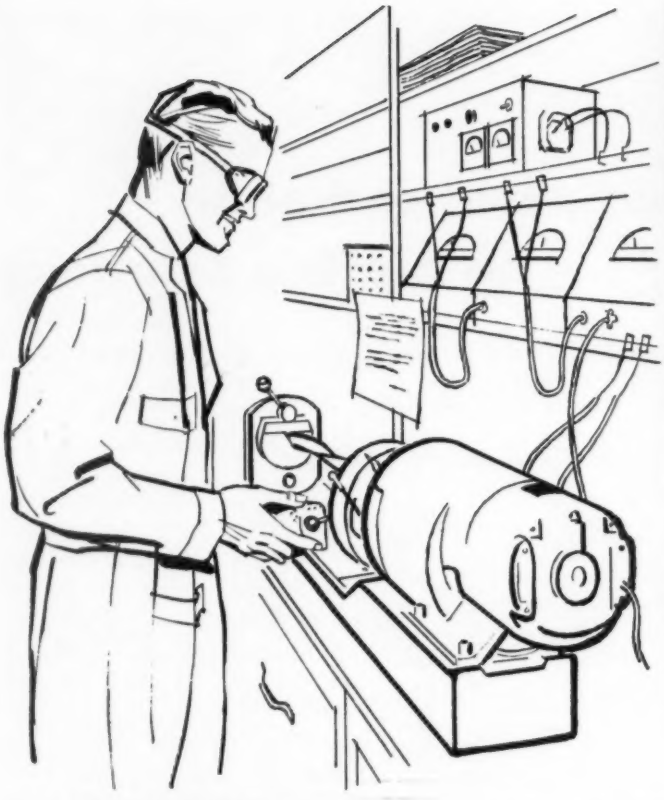
2. Add 1 ml of fresh gelatin solution. Dilute to 50 ml with distilled water and mix.

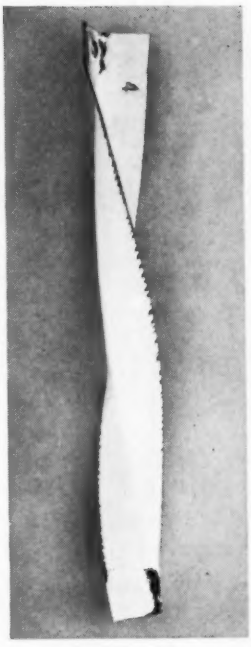
3. Rinse out the polarographic cell with some of the sample, then fill the cell.

4. Bubble oxygen-free nitrogen through the sample in polarographic cell for 3 minutes. *to Page 51* →

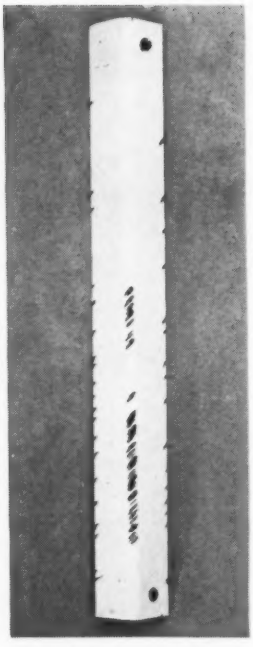
Figure 1 — A typical polarogram of cadmium plating solution.







Enameling iron, with 1 coat of porcelain enamel over Parker Pre-Namel 410, was twisted 255° before enamel fractured.



Enameling iron, with conventional 2-coat system of porcelain enamel, fractured badly when twisted only 70°. (Twisted less than its elastic limit, metal returned to its original shape).

NEWS OF A REVOLUTION

that's about to happen!

Porcelain enameling on steel has always been a preferred finish. However, its use has been limited by cost and by difficulties in the processing.

Now, a big change is about to take place. It is coming about through a cooperative effort that we feel should be acknowledged.

First, Parker Rust Proof Company's research discovered and developed a surface treatment for steel which permits the application of the porcelain enamel finish coat directly to ferrous metals, reduces cost, improves quality and eliminates many production difficulties in porcelain enameling. For production evaluation, Frigidaire Division of General Motors and Pemco Corporation entered the effort with pilot runs and production tests.

The new treatment, making use of Parker Pre-Namel 410, has been shown to simplify porcelain enameling, achieve high quality uniform results, reduce use of frit, produce a more durable finish. Savings of from 1 to 3 cents per square foot of enameling surface are indicated.

We gratefully acknowledge the help we've had from Frigidaire and Pemco. Here is another instance of companies in diverse lines cooperating in a development program today which should benefit hundreds of manufacturers and millions of their customers in the future.

**Bonderite, Bonderlube, Parco, Parco Lubrite, Parker Pre-Namel—Reg. U.S. Pat. Off.*

1915 40th year 1955

Since 1915—Leader in the Field

PARKER RUST PROOF COMPANY

2157 E. Milwaukee, Detroit 11, Michigan

BONDERITE	BONDERITE and BONDERLUBE	PARCO COMPOUND	PARCO LUBRITE	TROPICAL
corrosion resistant paint base	aids in cold forming of metals	rust resistant	wear resistant for friction surfaces	heavy duty maintenance paints since 1883

A look ahead at appliance sales

with comments on sales trends, built-ins, color and industry growth

by John F. McDaniel • VICE PRESIDENT, MARKETING, HOTPOINT COMPANY, CHICAGO.

ON the basis of 30 per cent increase in factory shipments, a 23 per cent increase in distributor sales, and a 14 per cent increase in retail sales *(the first five months of 1955 as compared with the same 1954 period)* the outlook for the appliance industry is very healthy.

Consumers now have greater values and conveniences and a wider variety of features in electric home equipment than ever before. At the same time, retailers are stocking appliance merchandise which can be translated into substantial profits providing that sound selling practices are put into effect . . . Manufacturers, distributors and dealers are in a good position to grow with the expanding national economy if they are willing to fight for their position in the competitive market.

The appliance business is being revolutionized and broadened by the addition of built-in appliances and color.

Appliance dealer ranks are being thinned by attrition brought about by stiffening competition. In 1940, there were approximately 51,000 appliance dealers in the United States. This rose to a high in 1950 when there were more than 86,000. The number has steadily decreased to an estimated 67,000 in 1954. Studies show that a high percentage of failures were distress merchandisers rather than sound reputable merchants.

Built-ins equal 11 per cent of electric range sales

Two developments in appliances are most significant at this time. The first is the rapid acceptance of built-in equipment. At first confined largely to ranges, the trend is now expanding to refrigerators, dishwashers, and laundry equipment. Built-in equipment lends itself well to custom installation without high cost. It is ideally adapted to new houses where kitchen space is at a premium.

We believe that built-in equipment will become a more dominant factor each year. However, conventional appliances as we have known them for many years have an established future, particularly in rental units and low budget income brackets.

APPLIANCE UNIT SALES

1952	approx.	9,500,000
1954	"	11,200,000
1955	"	12,200,000*
1964	"	20,160,000*

* Projected

Built-in range sales now account for about 11 per cent of total range sales for the industry. In my own company, the percentage is considerably higher and we look for continued steady increases.

80 per cent of builders construct four houses or less per year

Builders are doing the bulk of the built-in appliance business because installation is involved in either new home building or remodeling. Most manufacturers recognize that, while retailers are unable to compete for big housing development bids, many retailers have an excellent potential among the small builders building up to four houses a year. This accounts for approximately 80 per cent of all builders.

Some dealers who specialize in kitchen planning and remodeling are doing an outstanding job with built-in equipment. Hotpoint is making a concerted effort to offer appliance dealers merchandising aids to get into the built-in field. Approximately 15 per cent of our dealers have purchased store display backgrounds and samples of built-in equipment. This is evidence that progressive dealers are aware of the potential in this field and are doing something about it.

We have learned from a nationwide home promotion which we are now conducting that appliance dealers and builders, as well as home furnishings stores, can effectively team up in a program that has very strong consumer appeal. The modern electric house is an ideal rent-free showroom for appliances as well as all types of home furnishings. Some 200 Hotpoint houses built in all major cities in the country are stimulating appliance retail activity.

Color must be dramatized

In the field of color, the appliance business has been slow to move until this year when consumers now have a choice of a full range of colors as well as simulated wood textures, brushed chromium, stainless steel, copper and other metals. Without question, the automobile industry has set the pace in color merchandising, indicating that consumers definitely want unusual color combinations. In addition, color has successfully invaded the home furnish-

to Page 73 →

it's as easy as this...

FOR
GAFFERS & SATTLER

PERMA-VIEW

the window you can see through always!

"out of our carton— into your door"

Yes sir, it's as easy as this. The PERMA-VIEW oven door window comes to you ready for immediate installation in your range — to add a sales feature second to none.

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." This "non-fog" window meets the constantly growing demand for "visible baking."

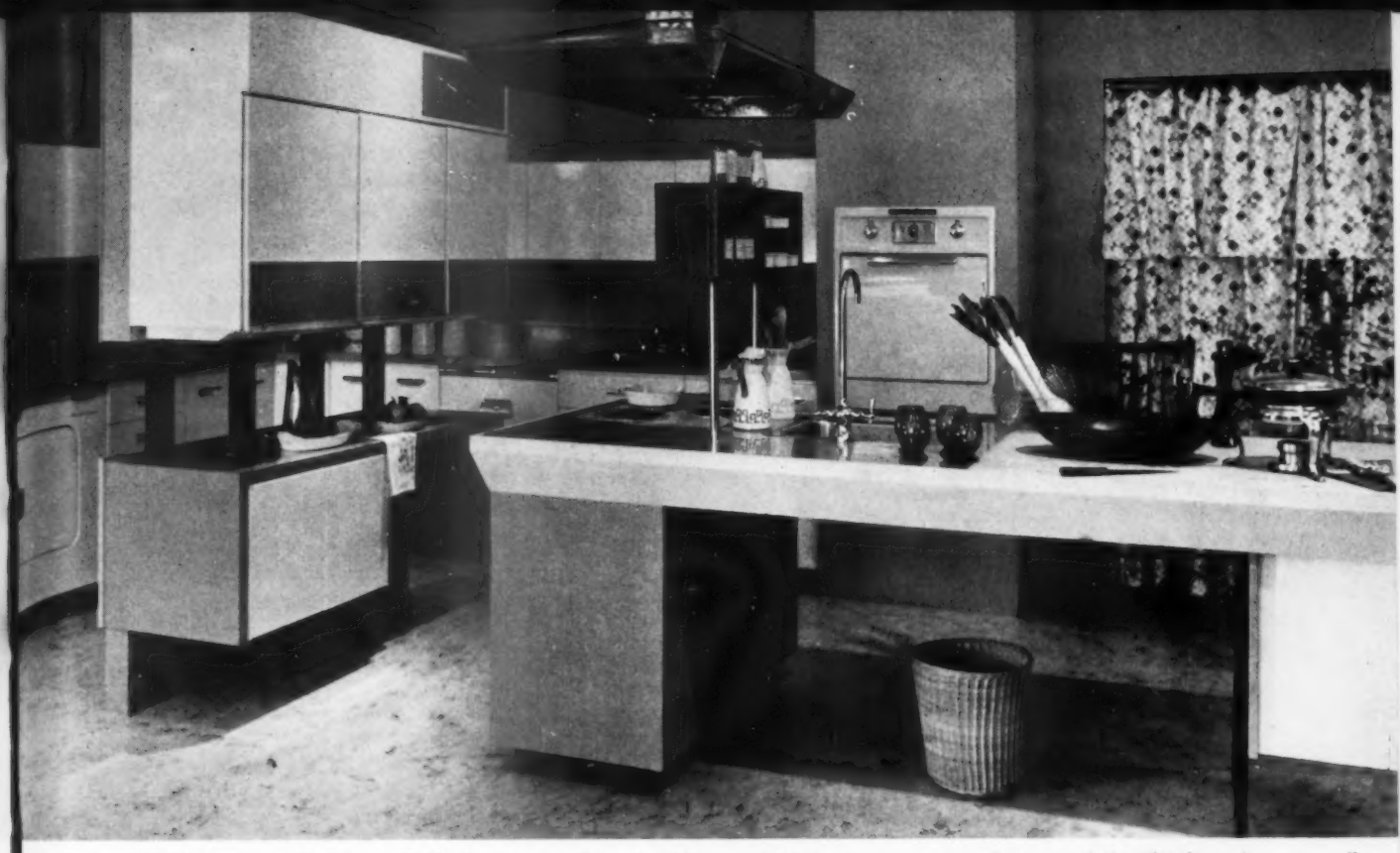
More and more range manufacturers are turning to PERMA-VIEW as a practical, economical and effective sales feature for their new models. We will gladly work with your engineering department in adapting its use to your range. Write or phone for complete information.

Phone MArket 4-2256

Gaffers & Sattler, A Division of Utility Appliance Corp., is another satisfied Mills Products customer. The 1955 Gaffers & Sattler double oven model shown at left is equipped with two PERMA-VIEW windows.

MILLS PRODUCTS, INCORPORATED

1015 W. MAPLE ROAD • WALLED LAKE, MICHIGAN



One of nine G-E kitchens, on display at Rich's Department Store in Atlanta, which incorporate many features of the "kitchen of tomorrow".

Appliances for tomorrow

this special report on the future of the appliance and kitchen supplier industries contains a review of general trends in home living with regard to their influence on the "kitchen of tomorrow"

PART II

by Dave Chapman • *FELLOW, SOCIETY OF INDUSTRIAL DESIGNERS*

finish

With direct reference to the appliance and kitchen supplies industry, let's very briefly answer the basic research questions and then draw a few sample conclusions that are in themselves revealing and pertinent.

In the case of purchase for existing dwellings ("first purchase" for newlyweds or replacement to fit a remodeling plan), the buyer of kitchen equipment will be the homemaker. The purchase will be largely controlled by the desire of the woman, but the man will exert some influence on the actual purchase of major home appliances involving major investments.

In the case of installation in new homes, there is every indication that the contractor, builder or architect will control the purchase of major appliances included in the price of tomorrow's home. The homemaker will still express her choice in many cases, but even her selection of small appliances will be affected by the general functional and visual "atmosphere" established by the installation of major appliances.

The man of the house is the man about the kitchen

The day of household help as a general service has passed into history. In the servantless kitchen of tomorrow, the functions of food preparation and service will be carried out primarily by the homemakers. You will note that I use the plural

"homemakers", because the man of the house is becoming an increasingly cooperative partner in the program of running a home. He is, in part, fulfilling the need for help formerly satisfied by household servants.

The homemaker, you can be sure, will not be as indifferent to the visual and functional satisfaction derived from the equipment as was the hired cook or maid who looked at appliances as little more than work tools.

And when the man of the house gets around to running the dishwasher or automatic laundry equipment, he will not be passive to details of structure, function or maintenance.

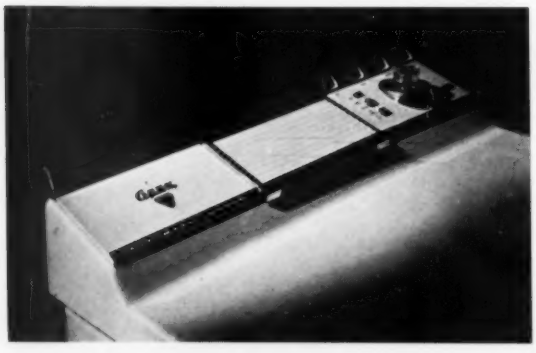
Where is the product going to be used?

In the home, to be sure. But what type of home . . . and will there be a kitchen room in the traditional sense, or even a kitchen area in the more contemporary manner?

The high cost of building has led many home buyers to plan their purchase on the number of square feet they can afford at so much per square foot. Within that living area, they hope to include all the facilities for the functions of their daily routine.

The new kitchen is no longer a room — it is a function

The area in which the kitchen function is performed is generally in plain view of other living areas. It is obvious that neither the laboratory white aspects of kitchen decor nor the "red-and-white-kitchen-bright" color schemes for room and accessories acceptable in the past will be acceptable under this new concept of space delineation for the kitchen function.



Dashboard dial of new dryer designed by Dave Chapman for Apex Electrical Mfg. Co. features colored push-button controls and pin-light cycle indicators in color. The dash assembly is simply a variation of the dash assembly for the twin washer and dryer (below), and is mounted on a basic top panel.

How is the product going to be used and what must it do?

Even as recently as our parents' generation, kitchen equipment was used to transform the "raw materials" of the living routine into usable home products or services:

Vegetables came into the kitchen right from the garden, fresh-air market or the farmer's basket. They were made ready for cooking in a preliminary cleaning step largely replaced today by the retailer's service of packaging and freezing.

Lard was rendered and soap was prepared in large heavy caldrons on heavy duty stoves. This process is rarely found today, even in the most rural community.

Laundering was a heavy duty operation carried out in the recesses of the basement. It is now a kitchen or first floor function.

Bread was set to rise in large receptacles, baked in large ovens. Commercial bakeries have replaced this chore with pre-baked or partially baked goods.

The appliance of tomorrow, then, will be used to *complete* the job of preparation begun by others, or do the entire job automatically. In many cases the appliance must *warm* instead of *cook*, *brown*, instead of *bake*, and work *automatically* rather than *manually* whenever possible.

New products must justify their creation by doing a job *more easily* and *better* than it has ever been done before.

For a realistic survey of the "kitchen of tomorrow" look to those very important influences outside the appliance industry such as supply of food, living standards, social patterns, architecture.

Work of the designer's office in fields tangent to kitchen appliances gives an unusual insight into these factors.

For example, in current design study of not only home but commercial refrigeration equipment as well, we see exciting changes ahead in the

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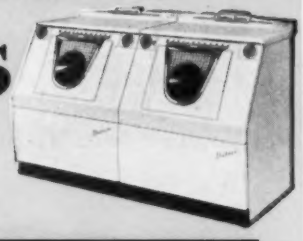
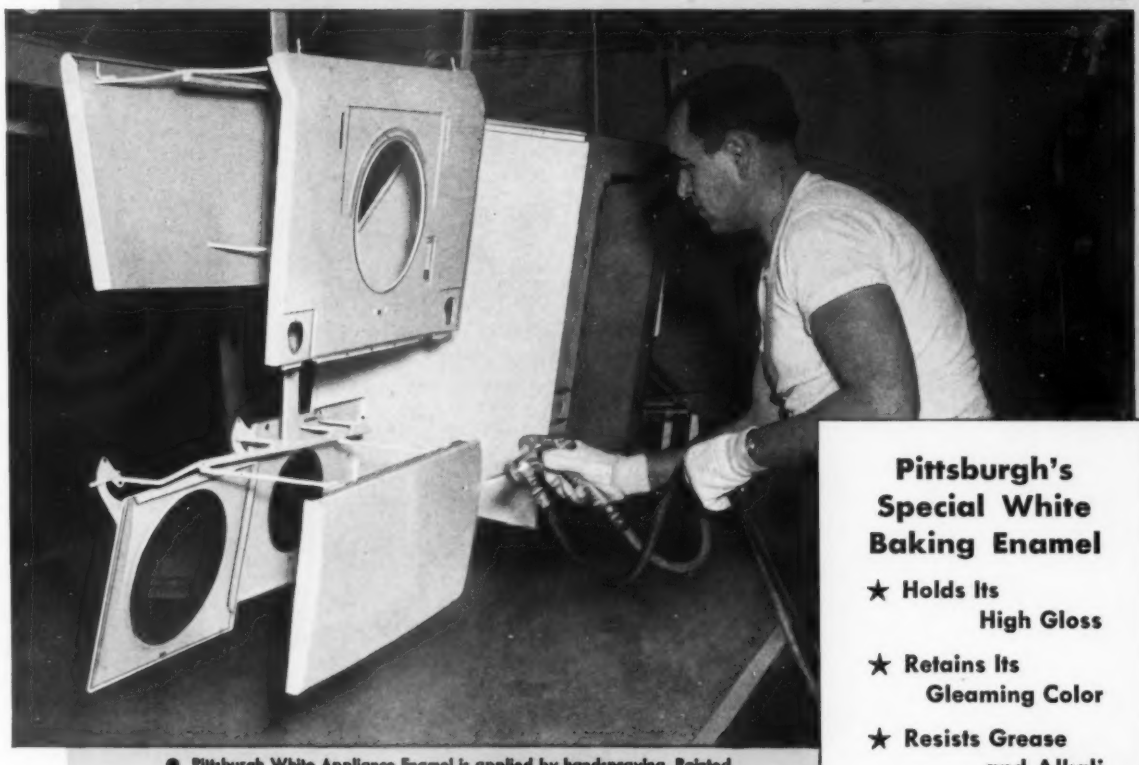
Here's Why Famous

Westinghouse Laundromats

Keep Their Initial Beauty Longer!





● Pittsburgh White Appliance Enamel is applied by handspraying. Painted panels are baked for approximately 30 minutes at 300 degrees Fahrenheit.

Pittsburgh's Special White Baking Enamel

★ Holds Its High Gloss

★ Retains Its Gleaming Color

★ Resists Grease and Alkali

Outstanding for durability, color holding and gloss retention, Pittsburgh's special White Baking Enamel contributes to the popularity of such nationally known Westinghouse home equipment as "Laundromat" washers and dryers, electric dishwashers, roaster ovens and hot water heaters.

By working with the technical and production staffs of Westinghouse, Pittsburgh has developed finishing materials of exceptional high quality to meet a variety of performance standards.

Pittsburgh's special White Appliance Enamel is simply and easily handsprayed. It dries in half an hour to a rich gloss that enhances the initial beauty of these products. This beauty is matched by a toughness that keeps them looking new longer.

The finish is so durable and flexible that it possesses unusual mar resistance. It also withstands the dulling effects of heat, moisture, grease and the alkalies and other chemicals used in today's detergents.

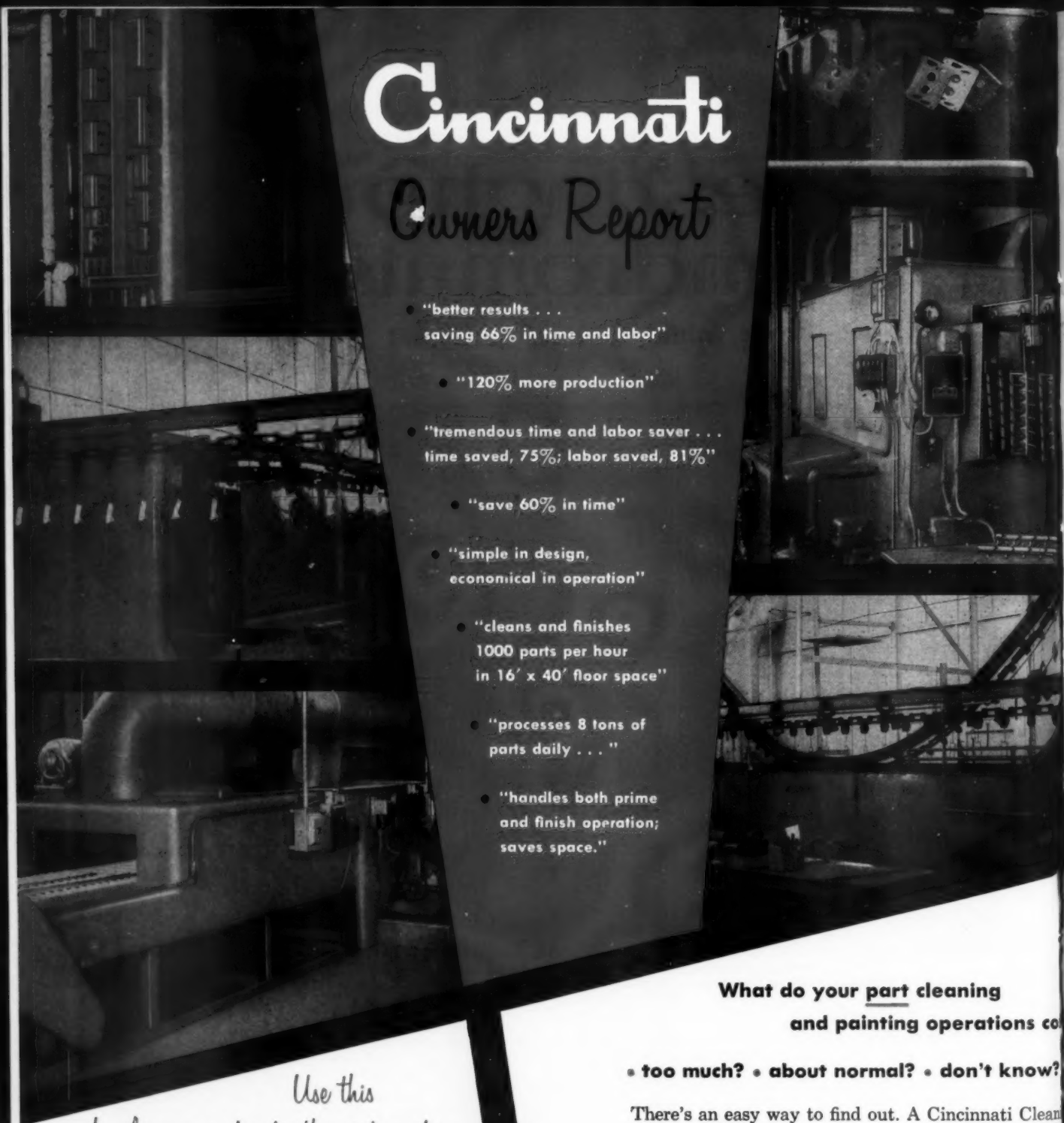
Our wide experience in supplying all kinds of appliance finishes to leading appliance manufacturers may save you time and money. Write, wire or call Pittsburgh Plate Glass Company, Industrial Paint Division, 1 Gateway Center, Pittsburgh, Pa.

PITTSBURGH PAINTS

PAINTS • GLASS • CHEMICALS • BRUSHES • PLASTICS • FIBER GLASS

PITTSBURGH PLATE GLASS COMPANY

IN CANADA: CANADIAN PITTSBURGH INDUSTRIES LIMITED



Cincinnati

Owners Report

- "better results . . . saving 66% in time and labor"
- "120% more production"
- "tremendous time and labor saver . . . time saved, 75%; labor saved, 81%"
- "save 60% in time"
- "simple in design, economical in operation"
- "cleans and finishes 1000 parts per hour in 16′ x 40′ floor space"
- "processes 8 tons of parts daily . . . "
- "handles both prime and finish operation; saves space."

What do your part cleaning and painting operations co

• too much? • about normal? • don't know?

There's an easy way to find out. A Cincinnati Clean engineer will gladly survey your present or future requi ments and give you a no-cost, no-obligation answer t may point to savings as important as those quoted abo

Whether you're interested in cleaning alone or a spa time and labor-saving integral finishing system, Cinc nati has the experience and technical knowledge to g you a straightforward estimate of possible savin

Cincinnati

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Use this handy coupon for further information

CINCINNATI CLEANING & FINISHING MACHINERY CO., INC.
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☐ *Tell us how a Cincinnati engineer can point out time and labor savings and production increases in our cleaning.*

☐ *Have your representative call.*

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Company_____

Address_____

City_____ Zone____ State_____

Summer homefurnishings market

leaders in the home furnishings industry reported excellent business and presented optimistic views for the future at industry meetings

LEADERS in the appliance, housewares, radio, and television fields reported excellent business and optimistic views for the future at various meetings and in round-table discussions held during the Summer Home Furnishing Market in Chicago. Speaking for the electric appliance field, John F. McDaniel, vice president of Hotpoint, estimated electrical appliance industry sales in 1955 will be nearly 12 million compared with 11,200,000 last year. C. M. McCreery, vice president of Revere Copper and Brass, reported sales of housewares this year at 14 to 20 per cent over 1954. Edward R. Taylor, vice president of Motorola, indicated the possibility of black and white television sales increasing to 7½ million sets and radio sales in excess of 12 million, compared with 7,300,000 and 10½ million respectively in 1954.

Although some exhibitors at both the American Furniture Mart and the Merchandise Mart reported favorably on interest and orders, it is quite apparent from attendance at 1954 and 1955 Summer Markets that, as far as the appliance manufacturer is concerned, the chief attendance and interest of buyers is focused on the Winter Market. Top executives of the manufacturing companies could be found in display spaces for the first two or three days of this year's Market but, on later visits, the top brass were reported to be back at the home front.

From an educational standpoint, the Summer Market could be rated high, for there were numerous talks by men and women of importance to the industry and an increasing number of round-table discussions. Editor's briefs from some of these will be included in this report.

Built-ins and color take the spotlight

From the standpoint of the appliance industry it becomes increasingly evident that built-in products and the use of color in the kitchen have gained the attention of top management, production men and sales executives far out of proportion to the reported current percentage of sales in either classification. Some manufacturers feel that in either case (built-ins or color) the products will not gain sales volume comparable to conventional free-standing appliances and the all-white products. Nevertheless, there are few who are willing to disregard these two important trends in relation to the future of their business.

Random comments

Following are a few of the comments from exhibitors at the Market as told to our editors:

E. N. Stiglitz, *The Stiglitz Corporation, Louisville, Ky.*, "oldest stove manufacturer in the U.S.A.", was showing "Infra-Aire" built-in ovens, built-in cooking units and "Sun-Aire" automatic gas and electric clothes dryers. The products are designed so that either ovens or cooking tops are interchangeable in the kitchen between gas and electricity as heat sources. Stiglitz reported that the company has been manufacturing built-ins for three years. He expects that business will be big through the kitchen cabinet manufacturers and distributors. "We are concentrating on that idea," he said, "and we will sell the man who sells 'Mr. Builder'." The Stiglitz built-ins are offered in a variety of finishes — brushed chrome; grey, white and black porcelain (with stainless steel doors); and in copper plate. The copper finish consists of copper plating plus three coats of clear silicone type finish over the plating; the finish is cured at 600°F.

Reeves Brown, *vice president, Hardwick Stove Co.*, reported that built-in units by this company would be ready for delivery by November. Brown said that his company would favor standardization for built-in cooking equipment. (American Gas Association has already made some recommendations with respect to "cut-out" size.)

LeRoy Klein, *vice president in charge of sales for Caloric Appliance Corp.*, has some reservations concerning the use of color on products as permanent as a kitchen range. However, the company is prepared to offer four colors (yellow, blue, green and pink) in addition to standard white on its line of ranges. Colors are on special order with three to four weeks for delivery and a slight increase in price, ranging from $15 to $20 depending upon the model. Caloric is showing a new, clean-looking oven interior (blue-grey granite grained). As for built-ins, Klein feels that there is definite possibility at the builder level but points to the fact that they do not represent a major market as yet. He feels that trend to "shopping" sample homes is building a desire for built-in products. Apparently Caloric is cognizant of the importance

LeRoy Klein, Caloric Appliance.

of market and dealer displays also, for our editors have noted a number of Caloric built-ins in the displays of cabinet manufacturing, etc.

Cecil M. Dunn, *president of Magic Chef,* is optimistic concerning the future of this long-time producer of cooking and heating equipment. The company had displays at both the American Furniture Mart and the Merchandise Mart. Said Dunn, "Give us a little time and our Magic Chef will worry our competitors."

Hal Koeppe, *sales, Automatic Washer Co., Newton, Iowa,* demonstrated the new automatic washer-dryer combination which is to go into production at once — price $395.00, with a 90-day money back guarantee. Chief feature of the new gas heated machine is that it employs no gears, clutches or crank arms. It has an over size cylindrical tub, 5½ cubic foot capacity and runs at constant speed throughout the washing and drying cycles. It provides for variable washing and drying cycles and has a heat limit switch for the dryer.

H. H. Flowers, *Youngstown Kitchens,* travels eight states for this leading manufacturer of steel kitchens. He presented some appealing names to describe the colors offered on Youngstown cabinets. They are Star White, Dawn Yellow, Sunset Copper, and Meridian Blue. Flowers reported that all colors were selling on about an equal basis nationally with yellow and blue the favorites in the Minneapolis-St. Paul area and copper the favorite in the West.

Cecil M. Dunn, Magic Chef.

Harold E. Green, *executive editor, Printers' Ink Magazine* — Many advertising and promotion budgets are up from 10 to 20 per cent for the same period last year. In several instances, they are from 50 to 100 per cent higher. Changes in media use include:

Newspapers — Of 12 key companies using newspapers, 8 will increase their newspaper advertising, two will use about the same amount of lineage, two will use less.

Television — Of 9 key companies using television, four will spend more advertising dollars in that medium; four will spend less; and one will spend the same.

National Magazines — Of 19 key companies using national magazines, 12 will spend more advertising dollars in that medium; seven about the same. *NONE will spend less.*

Radio — Of four key companies using radio, one will spend more in radio; *three will spend less;* one will spend about the same.

Trade Papers — Of 17 key companies using trade papers, seven will use more advertising in the medium; seven will use about the same; only three will spend less dollars.

Comments heard at the American Furniture Mart

Gen. Lawrence H. Whiting, *president, American Furniture Mart* — It is interesting to note that almost every report indicates that the public is spending its money for "middle" and "upper-middle" grades of home goods. People can afford things that were formerly considered "luxuries." Now they are in the "necessity" or "convenience" classification.

Louis Goodenough, *editor, Retailing Daily* — The new moneyed middle class — the group earning from $4,000 to $7,500 per year — is furniture's hope and salvation. This group jumped 40 percent in number from 1947, and 225 percent since 1929, and includes a third of the nation's families and holds more than two-fifths of the nation's spendable income. The 1954 average income was $5,330 and economists see it heading to $6,000 by 1960.

I have no figures on furniture *sales to builders* direct but I think you might be interested in these 1953 figures on sales *of appliances*:

Freezers — 8 per cent of production
Electric ranges — 9 per cent of production
Gas ranges — 5 per cent of production
Refrigerators — 13 per cent of production
Water heaters — 9 per cent of production

These are 1953 figures, and the percentages have grown enormously in two years. In other words, two years ago, 13 out of every 100 refrigerators produced were not sold through regular channels.

Last year, 6 to 8 per cent of Frigidaire sales were in color . . . 12 per cent of Hotpoint sales in built-ins. General Electric expects 20 percent of this year's sales will be on built-ins. The big market has been new homes. But there's a big push on now for remodeled homes.

In Philadelphia, a leading ad agency made a survey among retailers to find out what they wanted from manufacturers and their wholesalers. *91.4 per cent* of the retailers polled wanted manufacturers or wholesalers to *hold informative meetings* in their stores for them. *90 per cent* wanted salesmen to *talk to the stores' ad heads* about salient features of the products they were selling. *81 per cent* said they would find a *written sales plan* for promoting the manufacturer's goods a valuable aid.

Mary Davis Gillies, *editor, McCall's Magazine* — Leaders of the more than $15-billion industry are picking only the windfalls instead of reaching for the juicy apple ready to eat. The 'brides' market, around which the industry is centered, is a windfall market. Fewer than 600,000 new households are being formed annually. Postwar home building is another windfall market. The vast almost untapped market the industry must center on is the "drab homes stretching from coast to coast" and the mixed-up homes which vacillate between modern and hand-me-downs. The army of families who can afford to discard their decrepit and dingy old furniture — suffering from obsolescence

— and the increasing host of retired couples who are making a second start in life represent this lush apple dangling above the industry's head.

Donald M. Hobart, *vice president and research director, Curtis Publishing Co.* — The national population will jump to 176,000,000 by 1960 and climb to 30 million by 1975. The following facts will contribute to the industry's

Hal Koeppe, Automatic Washer.

unprecedented prosperity if they will fight for it:

1. There are 47 million households today and 56 million anticipated in 10 years.
2. People have more money and want to spend it on their homes.
3. The public's changing habits such as indoor to outdoor living.
4. More leisure, more education, better taste and more employed women who demand the latest in appliances.
5. Earlier marriages and larger families than a generation ago.

Curry W. Stoup, *Vice-President, Avco Manufacturing Corporation, General Manager American Kitchens Division,* says the steel kitchen cabinet manufacturers have been watching wood cabinets take 75% of the kitchen business for a good many years. He is cool on the matter of color for steel kitchens and offers the comment that "You find a lot more colored kitchens in the national ads and stores than you do in the homes."

American Kitchens' bid for the current market followed a survey on consumer preference. Their idea is to "marry the warmth of wood to the strength of steel." Says Mr. Stoup, "While our classic white kitchen has held its own in volume, the real rise has been achieved in the Pioneer line with its wood and copper exterior and rugged steel interiors." The company cites a sales volume from December through May of 136 percent of the same period last year as proof that it is on the right track.

E. N. Stiglitz, Stiglitz.

— There is a trend for more and more consumer banks to enter into the field of consumer credit. I can foresee the day when appliances, furniture, perhaps even the automobile, will be included in the mortgage on the home.

In the next 8 or 9 years, there will undoubtedly be 25 million more people in the United States *(representing at least six million more families).* It is estimated that in the next ten years people will have 52 billion more dollars of personal disposable income left — that's income after taxes.

Comments heard at the Merchandise Mart

Edward R. Taylor, *vice president of marketing, Motorola, Inc.* — The electronics industry is looking forward to the remainder of 1955 with optimism — and with good reason, every sign post points to a strong market for the remainder of the year. There is every indication that black and white television sales will be in the area of 7 to 7½ million sets for 1955, and that radio sales will soar past the 12 million mark.

Joseph F. Miller, *managing director, National Electrical Manufacturers Association* — About five years ago, the electrical appliance industry had a total factory square foot area of about 54 million square feet. That's a pretty sizable plant. We certainly were all impressed with the capacity of the industry at that time. But by '53, the factory square foot area of the industry had been stepped up to a total of 89 million square feet. That represents an increase of 65 per cent — a sizable increase.

In the last five years, the electrical appliance industry has sold approximately 338 million appliances. That covers the years '49 through '54. The industry says that, instead of 338 million appliances, they expect to produce *and sell* 428 million appliances (during the next five years). In 1930, there were only 19 different appliances. In 1940, there were 36 appliances. By 1953, there were approximately 54 appliances on the market.

George W. Cloos, *business economist, Federal Reserve Bank of Chicago*

WHAT'S NEW

Dixie Products — A new four-burner gas range with drop-in top, built into a handsome cabinet. There's a separate built-in wall oven to companion it. Also new is a range with griddle top center, four burners, look-through oven.

Altorfer Bros. Company — The ABC automatic clothes dryer with table top surface, time dial, two-way vent, fine mesh lint trap and perforated all-porcelain drying drum. Also shown is the ABC-O-Matic washer with exclusive jet-action "centric" agitator.

Gibson Refrigerator Company — A queen size 30-inch electric range in surf tone green. Features are controls that

Reeves Brown and R. H. Davis, Hardwick Stove.

glow, oven windows, sizzling platter for broiling in oven, 7-speed push button cooking and deep well cooker. Also shown are new chest freezers in two sizes, refrigerators with more storage space and air conditioners that can be installed as part of the room decor.

Geo. D. Roper Corp. — Economical new automatic gas ranges for easier cooking and cleaning with speed, and the Dry-Aire Automatic gas clothes dryer.

Speed Queen Corp. — Featured is a washer with 3-spray rinse, built-in suds-saver control, sediment ejector and exclusive in-a-door lint trap.

Lewyt Corporation — The world's only vacuum cleaner on big wheels. This no-lift, no-carry innovation can be wheeled across bare floors, over scatter rugs and thick carpets. It rolls over its own cord without tangling and carries all cleaning tools.

Acme National Refrigeration Co. — Everything WITH the kitchen sink in this item. This is a one-piece kitchen combo — kitchen sink, work surface, four-burner gas range and oven and refrigerator — all in one.

Welbilt Stove Company, Inc. — Silver Anniversary air conditioner with push button control, extra quiet, thermostat control, warms with built-in heater. New built-in wall stove that is flat with the wall.

Sunray Stove Co. — New 36-inch range with all-chrome top and chrome burner bowls. It is equipped with a space-maker shelf and "catchalator" oven bottom.

Arvin Industries, Inc. — A new line of compact and decorative portable electric heaters and a new line of table, clock and portable radios.

Blackstone Corporation — A new timer-controlled wringer washer to retail at a comfortable-to-the-consumer price.

Cribben-Sexton Co. — Universal "Atom-Atic" gas space heater operates on a counter air-flow principle and is available in 30 to 70,000 B.t.u. models. New 1955 line of Universal free-standing and built-in ranges.

Tappan Stove Co. — Moderate priced "Greenbrier" gas range remains the pace-setter for 1955 line of electric and gas ranges.

Admiral Corp. — New built-in range featuring a dial-temperature thermostatic surface unit that maintains heat at any pre-set level. The wall oven is equipped with an elevator broiler rack.

Kelvinator Division, American Motors Corp. — A "Foodarama" exhibit shows a smartly designed blue, white and silver refrigerator-freezer combo.

Servel, Inc. — The electric wonderbar is shown in new designs, styled as smart furniture — mahogany, white, modern blonde. Also air conditioners for standard and casement windows and new electric chest and upright freezers.

Troy Sunshade Co. — Summer furniture displayed previously plus several console and telephone tables in wrought iron with variety of glass and Formica tops.

Douglas Furniture Corp. — Dinette and kitchenette furniture with Coppertone, features copper accents and genuine copper apron with an antique hammered appearance. Chairs feature Coppertone grill backs. All narrow tubing on tables and chairs, whether chrome or black, have swivel glides with ferrules on the legs of the corresponding tables and chairs with brass or copper accents on the tubular chrome line.

Norge Division, Borg-Warner Corp. — Combination built-in range and matching steel cabinets to eliminate the need for in-the-wall installation; oven in white, copper, silver or gold-tone; cabinets in yellow, green, pink and sandstone.

Capehart-Farnsworth Co. — "Tomboy" 3-way personal portable radio with textured fabric cover over steel case.

Hotpoint Co. — "Eye-Hi" combination refrigerator-freezer with freezer on bottom with a separate inner door, mounted on casters. Showing all deluxe ranges, refrigerators, built-ins, washers, dryers and dishwashers in five colors.

Crosley Division, Avco Mfg. Co. — New Shelvador "100" refrigerator devoted completely to fresh food storage, with no freezer compartment; has 30 per cent more fresh food storage area than combination unit of similar bulk with freezer compartment; companion piece for homemakers with separate home freezers.

Aluminum Goods Mfg. Co. — New Mirro-Matic electric pressure pan that not only pressure cooks and cans, but also fries, steams, stews, boils and keeps food warm; has different temperature settings on dial for different uses.

Tracy Kitchens — Additions to "Pic-A-Dor" decorative front panel steel cabinets, adapted to every room in the house; shown in use as sewing chests, work benches, dining counters, bookcases, hobby desks, coffee tables and toy chests.

Quaker Mfg. Co. — New line of vented gas circulators and gas cabinet heaters.

Zenith Radio Corp. — New TV line with electronic "flash beam" gun that enables viewer to change channels, turn off sound during commercials or turn set on or off from across the room. A photo-electric cell is used with no remote control attachments.

Motorola, Inc. — New showroom displays entire consumer lines of radio, television and high-fidelity phonograph equipment.

Perfection Industries, Inc. — New line of cool cabinet gas heaters in a range of colors, the "Sierra Series." New 30-inch model gas ranges, first time in line.

Norris Thermador — "Masterpiece" oversize built-in oven.

Radio Corp. of America — Six new RCA-Estate range models; three 36-inch ranges, two gas and one electric; a full-size 40-inch gas range; two 40-inch gas range with "Thermo-trol" for automatic heat control of the built-in Griddall that converts to a fifth top burner. New "Mark" series of high-fidelity phonographs with Panoramic Speaker System that employs at least three separate loudspeakers in each instrument.

Westinghouse Electric Corp. — New "Built-In" kitchen featuring for the first time together in a complete kitchen display all seven Westinghouse built-ins: oven and surface units, refrigerator and freezer units, 25-inch wide Laundromat, dishwasher, water heater and food waste disposer. New line of colored appliances in yellow and aqua.

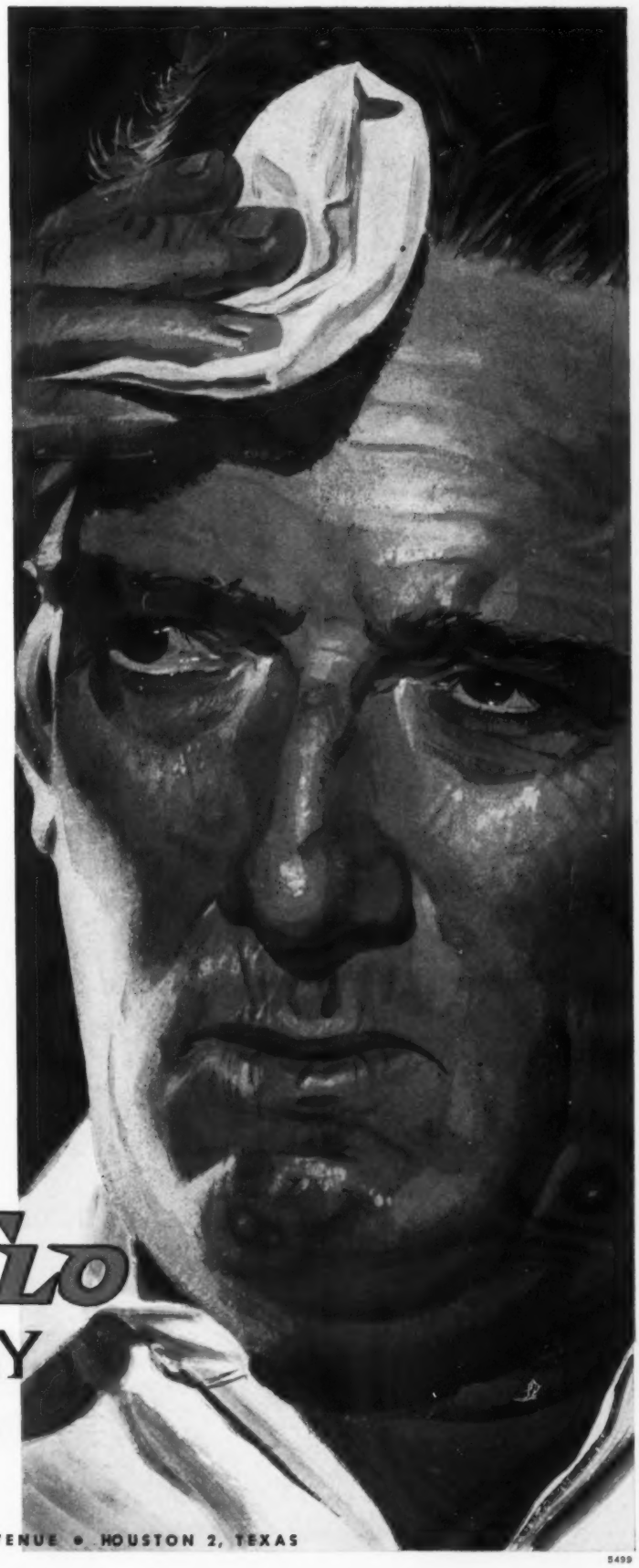
is your finishing department giving you a headache?

- Are rejects throwing your costs out of line?
- Are time and material costs eating up your profits?
- Are you getting consistent finishing room quality control?
- Are you satisfied with the appearance of your finished product?

Paint department headaches will disappear with Spee-Flo Hot Spray Heaters. Production costs will drop and consistent, all-weather quality control will be established.

We'll be glad to show you facts and figures on how other manufacturers in your field are producing better products at lower cost. Spee-Flo Hot Spray Heaters pay for themselves in the first few weeks of operation . . . they are long lived and trouble free.

LET US GIVE YOU AN ON THE JOB DEMONSTRATION



SPEE-FLO HOT SPRAY HEATERS

SPEE-FLO CORP. 720 POLK AVENUE • HOUSTON 2, TEXAS

5499

Frederic B. Stevens, Inc.

Detrex Corporation

Fourth industrial fin

42nd AES convention held

OVER 6,000 production and engineering executives are estimated to have viewed the fourth Industrial Finishing Exposition held in Cleveland's Public Auditorium on June 20 through 23. The 42nd annual convention of the American Electroplaters Society was held concurrently.

The Cleveland branch of the Society served as host to the annual gathering. Eugene L. Combs of Diamond Alkali Company was general chairman of the convention committee, and Leon R. Westbrook of Solon, Ohio, was general chairman of the exposition committee.

Clyde Kelly, who has served as first vice president of the Society for the past year, was elected president for the forthcoming year.

The many educational sessions held by the Society during this four day period included talks such as "Progress Made in Airless Spray Painting" by James Bede, International Development Company. Bede's talk was a complete description

Bede Products Corporation

Turco Products, Inc.

The Udylite Corporation

Ferro Corporation

ria finishing exposition

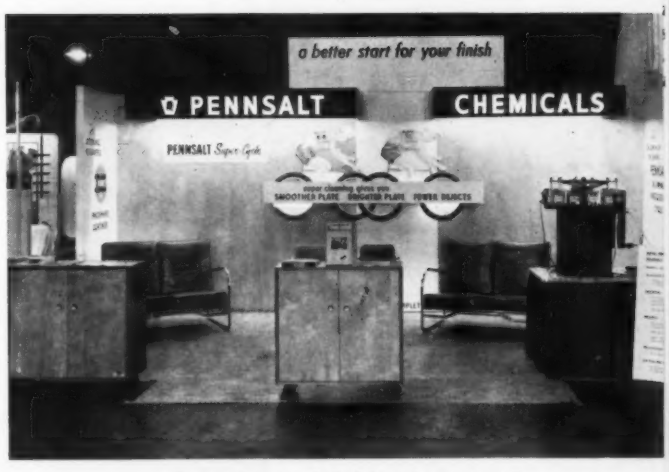
tio eld concurrently

of the theory and practice of airless spray painting. E. A. Zahn, General Electric Company, spoke on "The Flow Coating of Organic Finishes" which was devoted primarily to further the exploration of the so-called low pressure flow-coat method of paint application for industry. Another speaker was E. E. Bryant, Ferro Corporation, who spoke on "Qualities, Processing, and Future of Porcelain Enamel and Ceramic Coatings."

A total of 145 exhibits covering every aspect of metal finishing kept viewers at the Finishing Exposition busy. The various exhibits provided the very latest information on finishing techniques, equipment and supplies.

Apparently the exhibitors were very well pleased with the reception and interest displayed at the exhibit. In visiting with the various exhibitors, our reporter received favorable comments from all but one exhibitor.

The Spee-Flo Corporation



Pennsylvania Salt Manufacturing Co.

Binks Manufacturing Co.

International Nickel Co., Inc.

Wyandotte Chemicals Corp.

Cleveland Process Co.

Try Century Vit TITANIUM WHITE

1. COLOR STABILITY
2. HIGH REFLECTANCE
3. HIGH OPACITY
4. GLOSS
5. TEXTURE
6. WORKABILITY

With Century Vit Titanium cover coat over Century Vit ground coat enamel you have an unbeatable combination for adding beauty and durability to your appliance or other metal product.

Century frits are *time proved* in production plants before they are sold to you. The titanium frits give you the six characteristics: color stability, high reflectance, high opacity, gloss, texture and workability, so important to your plant and finished product.

Then too — you will save money 1) in frit cost and 2) on the production line.

A Century field engineer can show you how to improve your product and save money too if you will let us hear from you now.

FRIT from CENTURY
FRIT MASTERS

CENTURY VITREOUS ENAMEL COMPANY

• 6641-61 S. Narragansett Ave., Chicago 38, Ill. •

ernadine Bergeson was on hand welcome guests to the plant.

In matched operations department, visitors were shown some short run and development work. Left to right are Dan Andrise, No. Metal; John B. O'Donnell and Vincent Mangano, Motorola; Seymour Zolke, No. Metal; and Charles W. Arens, Motorola.

Seated at executive-type desk in hi new office is Clem C. Caditz, genia president of Northern Metal Products who personally conducted some of th group tours through the new plan

finish attends an open house

Northern Metal Products shows off its model stamping plant

WHEN Northern Metal Products Company celebrated its 25th anniversary three years ago, its contract stamping business had outgrown the facilities of its old Chicago plant.

Since additional manufacturing space was not available nearby, the compaany began looking for a plant site in one of Chicago's many suburbs, and found an ideal location in Franklin Park. Here the company built a model metal stamping plant with 70,000 sq. ft. of floor space

To show off the new plant to customers and to the families of employees, Northern Metal held an open house on June 11 and 12. During the open house the visitors got a glimpse of a 21,000 sq. ft. addition which has just been completed.

Left: Looking over a new welding machine are Karl Harig, Harig Mfg.; Arnie Bendoff, No. Metal; and Ted Harig, Harig Mfg.

Robert Notenberg, Art Specialty, and Merle Sanford, Admiral.

Ed Bendoff, No. Metal; R. Pongetti, Motorola; J. Carini, Monark Silver Kin

Right: Posing in front of a new 400-ton press are Jerry Poncher, I&H Sales; Ed Bendoff, No. Metal; J. P. Rossberg, Electrical Utilities of LaSalle, Ill. (Northern Metal's oldest customer); John M. Puppolo, Sprague Electric; and Jack Prebish, No. Metal.

Left: Walter Smith, head of Pal Products; Clem Caditz, head of Northern Metal; and Joe Kubert and Larry Aggerback, both of Booz, Allen & Hamilton.

Home appliances for tomorrow

(Continued from Page 34)

method of presenting food for sale in the nation's supermarkets.

Millions of families eating frozen meals

Within ten years, not just thousands, but tens of millions of Americans will be enjoying prepared and frozen meals — not just as separate foods, but complete pre-cooked dinners in a package. This dramatic increase in pace of a comparatively new technique of food sales will naturally demand parallel development of home equipment to handle what preparation is left to the homemaker.

The gourmet cook will certainly still follow the more demanding steps of food preparation. But he or she will be more of a minority than we find today. How many homemakers do you know right now who can bake a cake from raw ingredients that is better than one they can make from a prepared mix? And of those who can, how many have the time or will devote the time to the art of baking?

Thus, from the introduction of a new method of selling food comes a new social pattern — less work and less time in a kitchen for the homemaker.

A mental sketch of tomorrow's kitchen

I have offered here a pattern of design research thinking.

Even at this stage of preliminary research, many pertinent directions begin to take shape which offer a mental sketch outline to the picture of tomorrow's kitchen and its equipment.

1. With floor space at a premium, major equipment must be more compact and visually aid in creating the effect of space in limited areas.

Suggestion — There is no logical reason why base and overhead cabinets should either be as deep as they are or rest on the floor. Shallow, wall hung units offer several advantages:

a. A shortened depth dimension allows easy access to all storage space. The same reduction in dimension provides ample work surface, half of which today is dead area, used for knick-knacks or open storage, not a work function.

b. Wall hung units would create the feeling of spaciousness by providing exposed flooring in a kick area, now devoted to inconvenient "low crouch" storage.

Perhaps even more important, such units could be installed at the proper height for the user. *The arbitrary standard of cabinet height today could not logically be equally* convenient to both the four-foot-six and the six-foot-four homemaker.

2. Standard refrigeration and range equipment will be broken into even smaller modules than we already see.

The demand for frozen food storage will more than reverse the demand for freezers as compared to refrigerators.

Ovens will be individual units of shallower and wider dimensions — take up less space in over-all dimension.

Those burner units that are needed will be mobile for convenience in use *if* and *where* the homemaker needs them. *Neither built-in-range units nor wall-mounted units answer the demand for flexibility in use — they are little more than symptoms of a basic direction.*

Smaller, modular, flat or semi-finished built-in refrigeration units will be devised to serve particular functions, placed for convenience (i.e., salad drawer near the dining area, beverage cabinet and ice maker near the sink or living area, etc.).

3. The new functional pattern for kitchen use calls for more emphasis on lines of automatic cooking units as well as the creation of new units.

One of the most obvious markets for new equipment is awaiting the introduction of the induction heated "defroster drawer" or oven.

The homemaker arriving home one hour before dinner must have a quick and effective appliance for defrosting the turkey, fruit or seven pound roast waiting stone cold in the freezer. She doesn't want to plan a day in advance to defrost, and then anticipate spoilage if she changes her plans.

Give her an answer to her need — an appliance to do this job in a few minutes — and she will dig into the mattress money to buy.

Cooking at the dinner table

New automatic appliances—fryers, browners, roasters, rotisseries—have had notable success on the market. Next we must design these units in matched "family" lines to answer every need. *Then we must meet the new living pattern.*

Add, for example, a plug-in-rolling cart to take them near the dining area. The homemaker then can do her advance preparation in the kitchen area before guests arrive, roll the cart next to the dining table and greet the guests on arrival while the food cooks in full view. By the time she is ready to serve, the food is cooked, switches have flipped to "warm" and the food is at tableside for immediate service from a handsomely appointed new appliance — the gourmet cart.

4. The functions of existing appliances must be extended to justify replacement.

Equipment for the laundry function in the home, for instance, has progressed from standing tubs to manual equipment to automatics. Each improvement in functional procedure opened a new market and, most importantly, moved the per-unit dollar investment far up the scale.

Now we are working on combination automatic washer-dryer units that fit into the space formerly occupied by a single unit and function either for the dual process or either single process of washing or drying. The single housing in itself will naturally lead to eventual cost savings to the buyer—another sales incentive.

Design for living, not merchandising

This study leads to the realization that to *anticipate and create markets for kitchen equipment (or any new product) we must go back to basic* research of the needs of the consumer.

Today's standards of kitchen de-

to Page 51 →

DEFECTIVE PLUMBING-WARE

DEFECTIVE WASHERS AND RANGE TOPS

D-ENAMELING SAVES UP TO 50% OF ORIGINAL PART COST

THE CAUSTIC BATH

THE WASH-OFF

SANDBLASTING

Over the past four years, D-Enameling has more than proved its dollars and cents value to manufacturers of ranges, bathtubs, sinks, refrigerator liners and washing machine tubs. Before D-Enameling, these manufacturers had to scrap defective parts. All the material and labor that went into them was a complete loss. Now, for a small cost, these same manufacturers are able to transform defective parts into first line salable, profit-building products. To cost-conscious management it is obviously smart business to spend a few dollars to save many more. One stove manufacturer, for example, through D-Enameling has been able to save as much as 50% of the original cost of range tops. If you're interested in cutting costs, it will pay you to find out about D-Enameling now. You'll be agreeably surprised how much the simple economics of D-Enameling can benefit you.

May we discuss this soon?

THESE INDUSTRY LEADERS KNOW FROM EXPERIENCE THAT D-ENAMELING TRANSFORMS SCRAP LOSS INTO PROFIT DOLLARS

ARROW SIGN CO. • BRIGGS MANUFACTURING COMPANY • CAPITAL AIRLINES • CHALLENGE STAMPING & PORCELAIN CO. • CLEVELAND-TENNESSEE ENAMEL COMPANY • CONLON-MOORE CORPORATION • CRIBBEN AND SEXTON COMPANY • CROWN STOVE WORKS • DWYER PRODUCTS CORPORATION • ESTATE HEATROLA DIVISION • FLORENCE STOVE COMPANY, Kankakee • GIBSON REFRIGERATOR COMPANY • GLOBE AMERICAN CORPORATION • GRAY & DUDLEY CO. • ICE COOLING APPLIANCE CORPORATION • LAWNDALE ENAMELING CO. • A. J. LINDEMANN & HOVERSON COMPANY • MAGIC CHEF INC. • MALLEABLE IRON RANGE COMPANY • MAYTAG CO. • MURRAY CORP., Scranton • NORGE DIVISION, Effingham • NORGE DIVISION, Muskegon Heights • PRENTISS WABERS PRODUCTS CO. • GEO. D. ROPER CORPORATION • RHEEM MANUFACTURING CO. • SAMUEL STAMPING & ENAMELING CO. • A. O. SMITH CO. • THE ENAMEL PRODUCTS COMPANY • TYLER FIXTURE CORPORATION, Waxahachie • WHIRLPOOL CORPORATION, CLYDE DIVISION

New Process *D-Enameling* Corp.

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WEAN EQUIPMENT CORPORATION

22800 LAKELAND BOULEVARD

CLEVELAND-17-OHIO

REPLY TO
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CLEVELAND 17, OHIO

WARREN OFFICE
347 N. PARK AVENUE
WARREN, OHIO

A letter of interest to Every Press User!

Dear Sir:

During the last year our company has developed a new press of revolutionary design.

We have conducted a series of tests on this machine which has been witnessed by a large group of press experts.

The net impression of these people seems to indicate that our development may preface sweeping changes in the whole field of metal stamping.

It was our original intention to restrict the application of this press to certain specialized industrial fields, but it is now apparent that it has the broadest possible application and the pressure to release general information regarding its performance has been overwhelming.

We, therefore, use this open letter as an invitation to authorized personnel to see this machine in operation.

If you will express your desire in letter form on company stationery, it will receive our prompt attention.

Very truly yours,

WEAN EQUIPMENT CORPORATION

R. J. Wean, Jr.

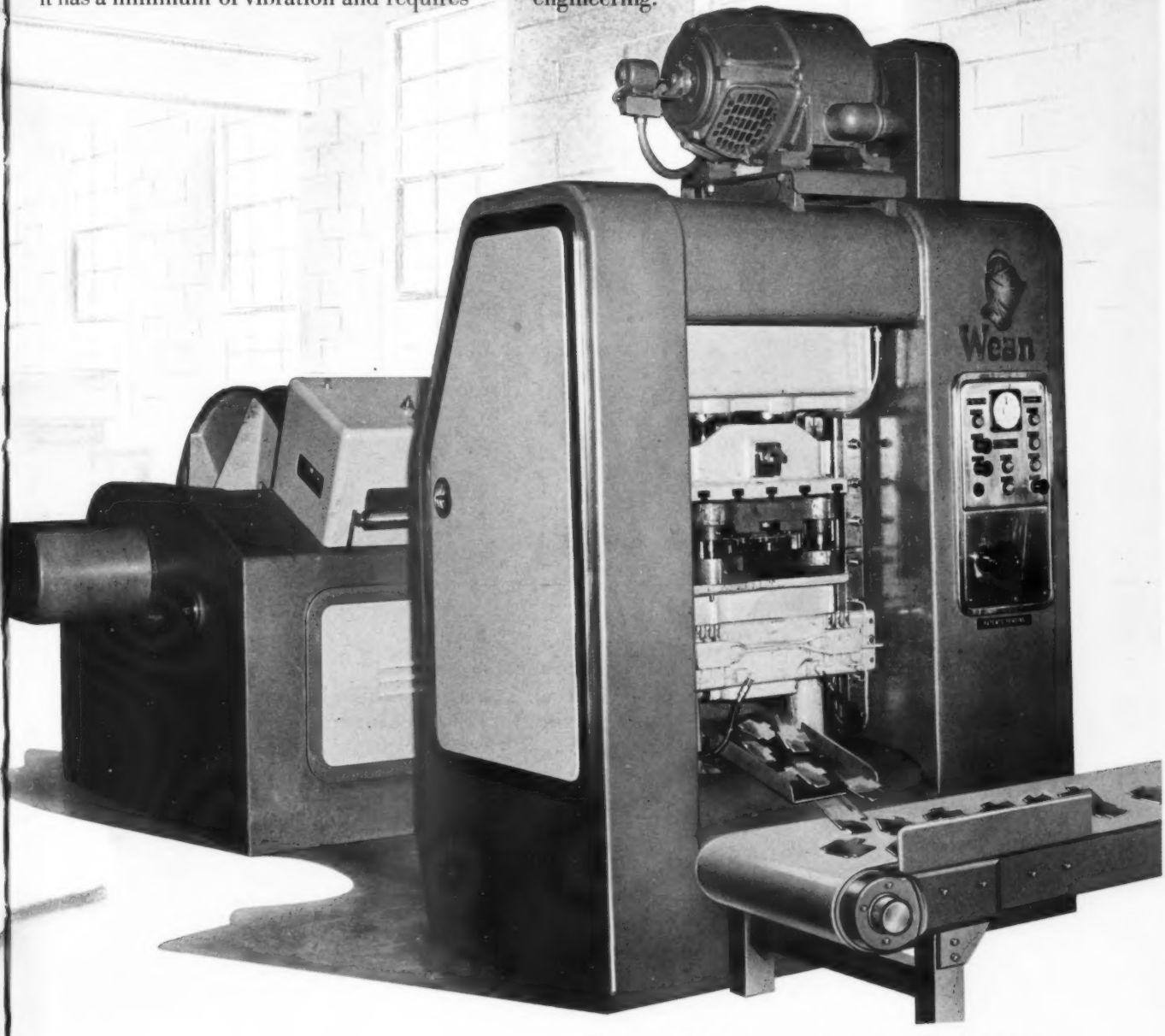
R. J. Wean, Jr.
President

Wean FLYING PRESS

Designed primarily for speed of operation, the Wean Flying Press is the first machine of its kind to successfully combine the fast operating advantages of continuously fed strip with dies which move with the strip.

The press differs greatly from conventional machines. Machine tool-like in appearance, it has a minimum of vibration and requires no foundation. In addition to its great speed, it incorporates several new design principles that should interest every press user.

An automatic adjustment of feed length while press is in motion, and the absence of a clutch and brake (the most frequent points of maintenance on conventional presses), are two examples of this advanced engineering.



Wean 60-ton Flying Press stamping out automotive hinge plates at 600 pieces-per-minute, using the same die set which on a conventional press made the parts at a rate of but 90 pieces-per-minute.

Wean EQUIPMENT CORPORATION Cleveland, Ohio

CHICAGO NEWARK, N. J. DETROIT Cable Address: WEANCOR

HAVE YOU SEEN THE NEW 1955

GENERAL ELECTRIC

Refrigerators?

with Revolving Shelves

when you do you'll see . . .

TINT-TANIUMS®

DIPPING VEGETABLE DRAWERS IN TINT-TANIUMS AT G-E APPLIANCE PARK, LOUISVILLE

Tint-Taniums are easily applied by either spraying or dipping (without streaking and without oxide separation) depending upon the requirements of individual parts involved. The above picture taken on the refrigerator production line at Appliance Park shows how General Electric dips vegetable drawers in Tint-Taniums.

an exclusive Chicago Vit Development

To capture its share of today's style-conscious, color-conscious consumer market, General Electric Company has added fresh new sales appeal to its 1955 line of refrigerators in a number of ways. One of them is through the use of Tint-Taniums on vegetable drawers. These colored frits, made exclusively by Chicago Vit, provide a number of distinct production advantages foremost among them being unequalled color stability. They are handled as easily as white titanium frits, and completely eliminate the chance for human error that exists in systems where colors are added at the mill. Tint-Taniums also bring you a number of distinct economic advantages. So, if you plan to use colors in your new products, you'll find it profitable to choose Tint-Taniums. There's nothing else like them!

THERE'S NOTHING LIKE TINT-TANIUMS

Chicago Vitreous CORPORATION

1425 SOUTH 55TH COURT • CICERO 50, ILL.

t-Tanium is a copyrighted name

→ *from Page 46*

sign have been largely dictated by the standards of existing merchandise.

New merchandise cannot find success on a market unless it meets and advances the new pattern of living.

We must study people, not products; a way of life, not a way of manufacturing or merchandising.

When we have done this, and honestly created new and better products, we will have answered the manufacturers' question, "Well, just what does the homemaker want?"

PERFECTION INDUSTRIES, HUPP CORP. PLAN MERGER

Perfection Industries, Inc., Cleveland, has announced that plans are under way to merge its operations with those of the Hupp Corp., manufacturer of stampings and complete assemblies for the automotive and major appliance fields.

Donald S. Smith, Perfection president and board chairman, will continue in charge of Perfection's activities.

Determination of cadmium in plating solutions

(Continued from Page 29)

5. Discontinue the nitrogen flow and take readings at —(negative) 0.8 volts and —1.6 volts versus a saturated calomel electrode. The difference in readings is related to cadmium concentration by previous calibration. The calibration is accomplished by running samples of known cadmium content through the same procedure as above.

Discussion

The accuracy of the method is demonstrated in the accompanying table. The cyanide plating solution itself furnishes an excellent supporting electrolyte for the determination. In normal cyanide media the half-wave potential of cadmium is —1.13. However, in the heavy cyanide concentration of the plating solution, the half-wave potential is on the order of —1.3. Because of the high cadmium content of the sample, the polarographic curve is quite broad, and readings are taken at —0.8 volts and —1.6 volts to insure measurements on the flat portions of the curve.

Operational variations in the concentrations of the bath constituents are without significant effect.

Of the impurities likely to be present in the cadmium bath, copper, lead, and iron either give no wave in cyanide medium or are adequately far from the cadmium wave to cause no interference. Zinc, although it gives a wave in dilute cyanide medium, does not form a wave in the cyanide concentration present in cadmium baths.

The polarograph, if not already available in the laboratory, will prove a valuable instrument in most control laboratories. Not only can it be used for such control methods as above, but it is ideal for the detection and determination of trace impurities.

For example, it is possible, even without full calibration, to establish maximum allowable polarographic readings for copper, zinc and lead in nickel plating solutions. Further, the polarographic is being considered for the determination of some classes of organic brighteners.

Comparison of Methods

Sample	*Electrolytic*	*Polarographic*
1	3.48 oz/gal	3.25 oz/gal
2	3.13	3.19
3	3.61	3.57
A	1.75	1.75
B	3.00	3.09
C	4.75	4.69

Numbered Samples — actual plating bath
Lettered Samples — synthetic mixture

The key to contract manufacturing—diversification

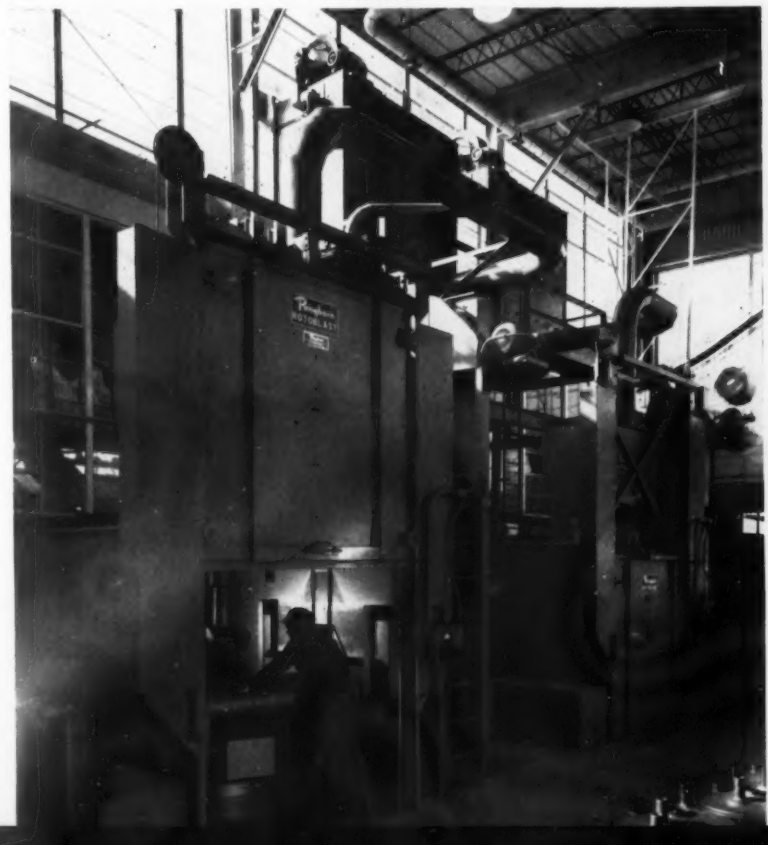
(Continued from Page 23)

pare the water heater exteriors for organic finishing. An iron phosphate type of coating is used. From the spray wash phosphatizing machine, exterior parts enter the dry-off ovens from which they move into the paint booths.

The heater casings are electrostatically sprayed — a two-coat, one-bake system.

The automatic water heaters are crated after final inspection and moved to the shipping platforms immediately adjacent to final assembly for either rail or motor transport shipment.

At the Heintz plant, twin steel grit blasting machines automatically remove all scale and rust from tank and flue surfaces that are to be glass-lined.



St. Charles ***kitchens have played an important part in the development of today's kitchen***

... and so has Du Pont DULUX® enamel!

Kitchens have come a long way since the St. Charles Manufacturing Company entered the field in 1935. Finding new ways to make kitchens more convenient, more pleasant to work in has been the constant aim of this company for the past twenty years. As a result, today's homemaker can have a kitchen that combines efficiency and beauty to a degree that the 1935 housewife never even dreamed of! The continued popularity of the St. Charles "Custom Kitchen" is proof that constant product improvement is vital in maintaining the acceptance of the buying public.

And so it is with America's leading home appliance finish—Du Pont "DULUX" enamel! Constant research over the years by Du Pont chemists has resulted in more rugged resistance to chipping, cracking, scratching or staining. easier cleanability . . longer-lasting beauty, in white or sparkling color. That's why the "DULUX" of today meets the most exacting requirements of today's topflight appliance manufacturers.

E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Delaware.

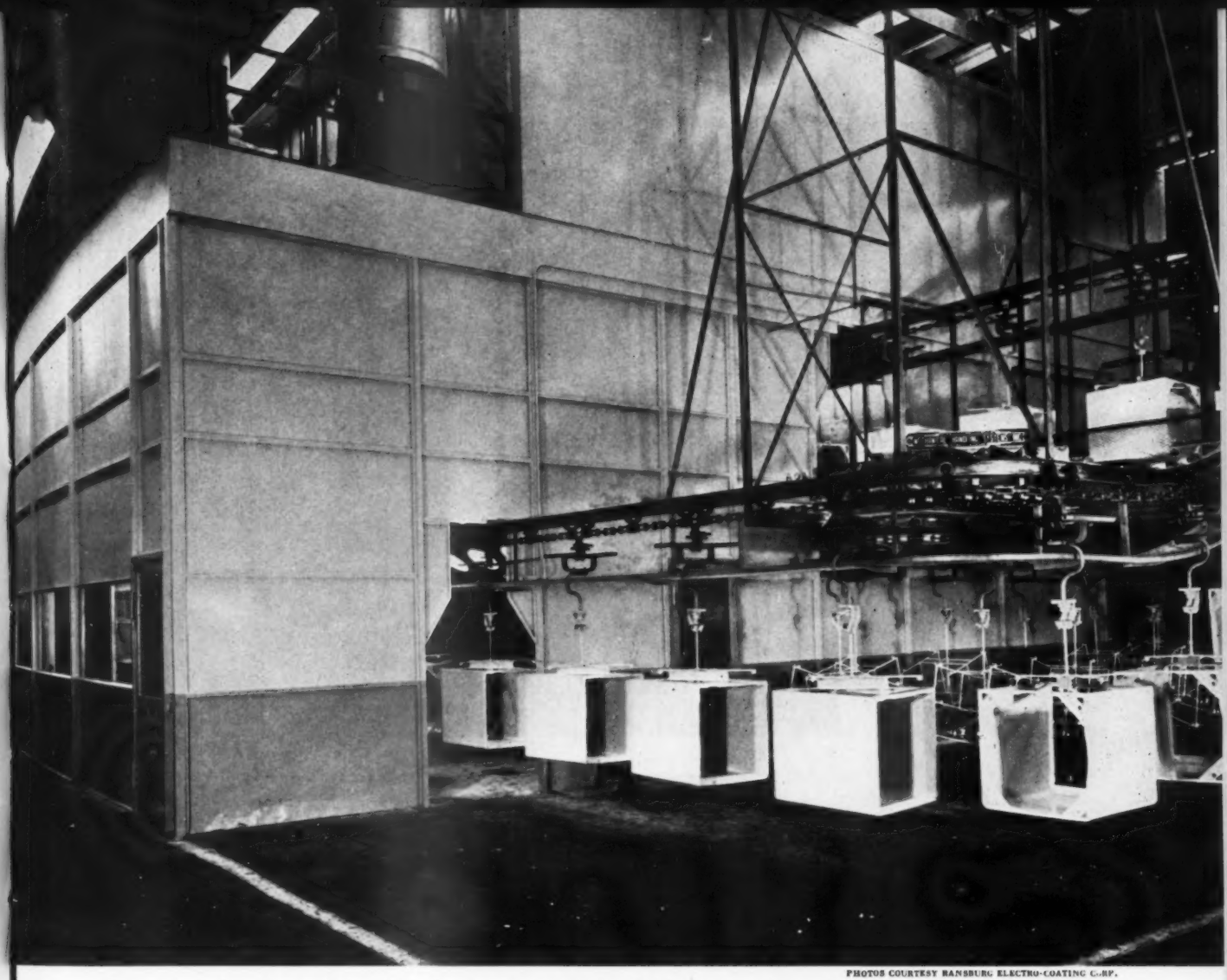
DU PONT

REG. U.S. PAT. OFF.

America's leading home-appliance finish

"DULUX" ENAMEL

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



PHOTOS COURTESY RANSBURG ELECTRO-COATING CORP.

Front view of modern paint system showing parts entering finish spray section and coming out of finish oven above.

at G-E's home laundry plant in Louisville, modern processing methods, the latest in equipment and material and a well-developed control system were combined to get . . .

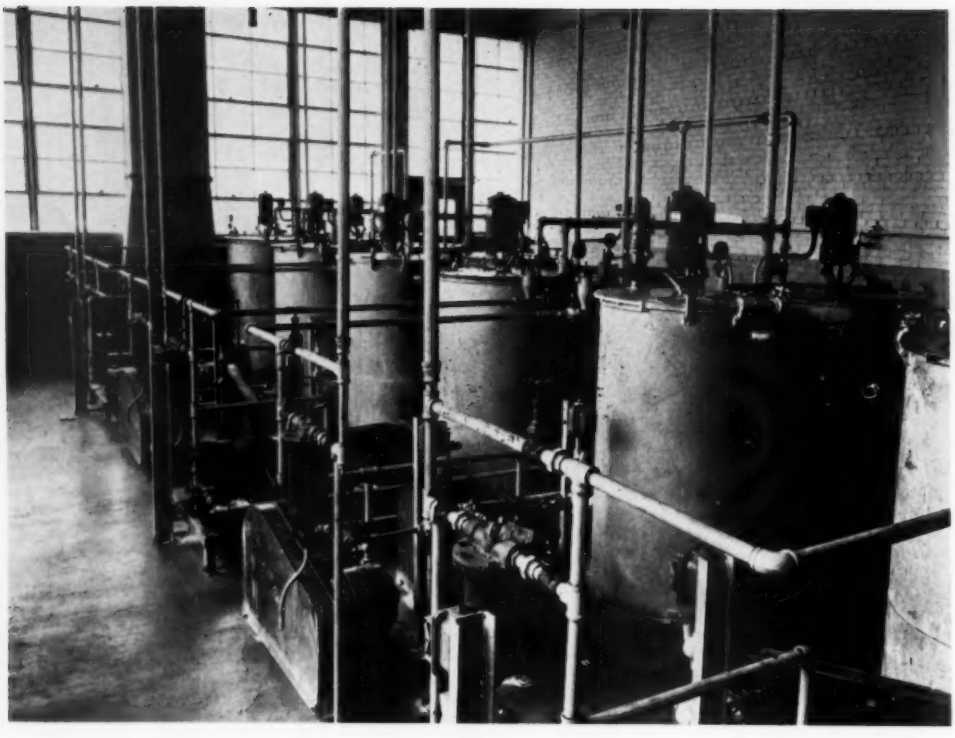
Increased mileage in the paint room

THE move made by General Electric Co. in transferring its production of home laundry equipment from Trenton, New Jersey, to Appliance Park in Louisville, Kentucky, is significant for the results achieved within 12 to 18 months after the move was completed.

Observers would say that most certainly much credit would go to personnel for the production improvements and reduction in cost of producing the G-E automatic washers and dryers. At the same time a trip through the paint application facilities as pictured in this feature demonstrates the importance placed in the installation of the most modern equipment and the use of the latest processing and control techniques.

The dryer operation in the new and modern plant at Appliance Park started in early 1953. The complete washer move from Trenton was completed in August of that year. Early in 1954, daily production had far surpassed the highest previous production at Trenton.

Painted parts for the washers and dryers are classified broadly as



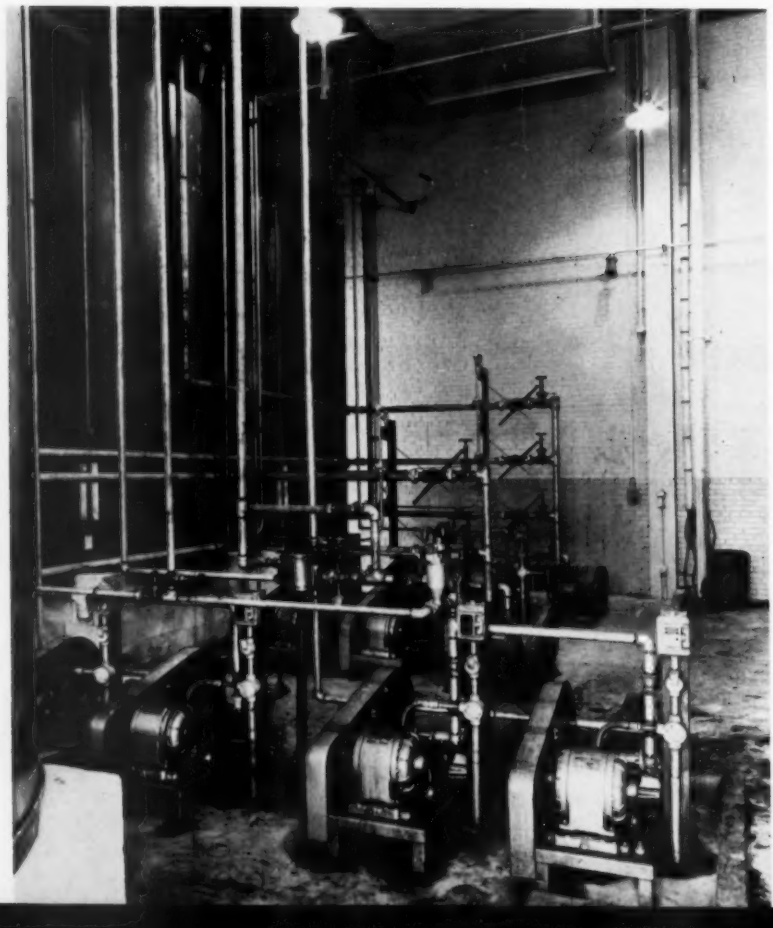
Left: Central paint mixing room showing tanks and pumps. The paint is pumped to spray booths and flow-coaters.

Left below: 5000-gallon storage tanks for solvents (left) and pumps which pump to the mix room and flow-coaters.

"white" and "black." Painted on separate lines, the white and black lines are combined going to assembly.

Black parts are flow-coated. White parts are coated electrostatically.

Material for the conveyor line handling the white parts comes over to finishing from fabrication on two supply conveyors. On the automatic washer, the cabinet is painted white. The six white parts of the dryer include two sides, a front, top and two components, the inner and outer door, which are combined to form the dryer door.



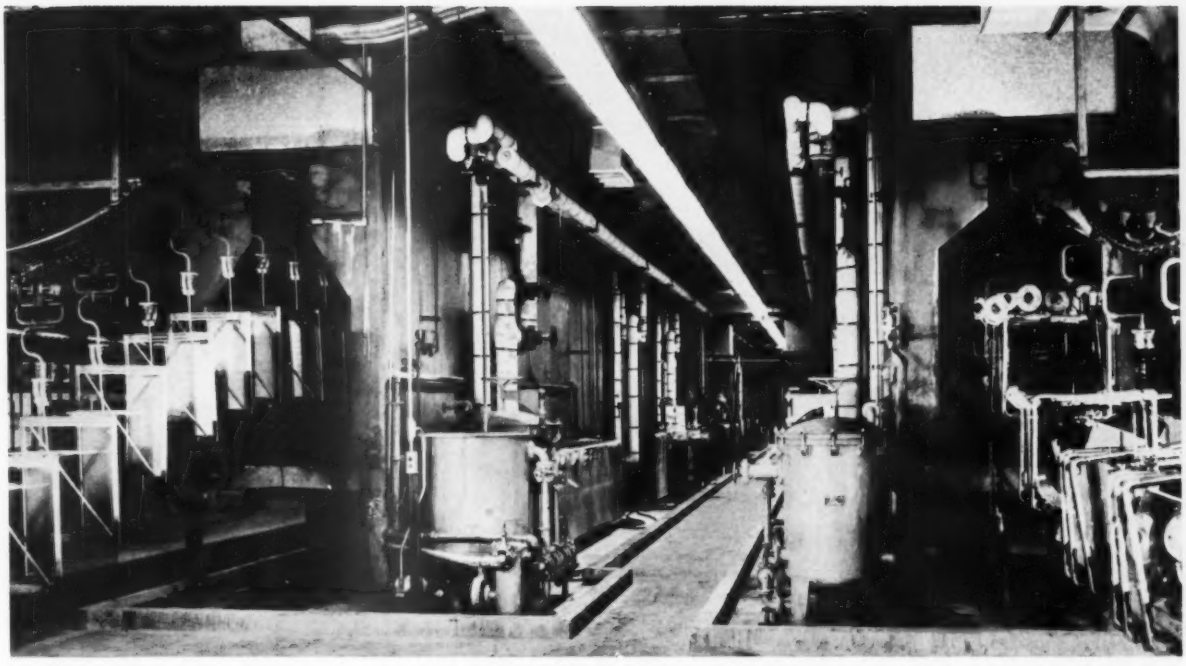
Parts to be painted are loaded on the monorail conveyor. Four hours and 10 minutes elapse from the time parts are loaded on the finishing line until they are unloaded in assembly. The continuous, straight-through conveyor eliminates building of banks and — in cutting down extra handling — lessens the possibility of damaging parts in process.

First entering the cleaning and phosphatizing machines, the work to be painted on the white line goes through seven cleaning stages: 1—cleaner; 2—rinse; 3—rinse; 4—phosphatizing; 5—rinse; 6—chromic rinse, and 7—deionized water wash.

After a five minute dry off in a steam heated tunnel at 300 degrees, the work makes a thirty minute cooling cycle on a "cooling" conveyor; then goes to the flow-coater for prime.

Two position racks are used for most of the parts to accommodate flow-coating and electrostatic applications.

Sides and bottoms of the cabinets are sprayed with nozzles in the flow-

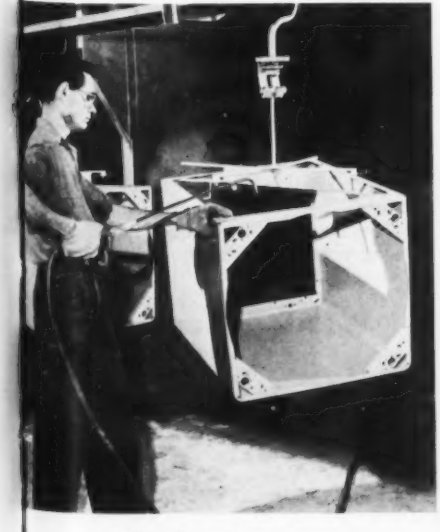


General view down through cleaning and phosphatizing machines, showing filters and cleaner tanks, and pressurizing air duct under platform which runs the entire length of the enclosure.

coater. The work then goes through a drip tunnel. Thirty minutes after baking, the work goes to the prime sand area where prime defects are sanded out. The work is repositioned automatically from 48″ to 36″ centers for electrostatic application in the electrostatic booth. Inner and outer doors are grouped at 40″ centers. Before entering the finish paint area, dust is blown off and outside surfaces get the "tack rag" treatment. Two hand sprayers in a water-wash booth reinforce on some irregular shaped sections and bracings just before work enters the electrostatic spray booth.

A row of windows lines the entire length of the 44-foot electrostatic spray area. Absence of overspray on the windows is an indication of the efficiency of the complete paint application system. There are two triple head electrostatic units used on either side of the conveyor line, and two triple heads at a lower level coat the underneath surfaces of the cabinets. Atomization occurs under the influence of the electrostatic field, producing a spray pattern engineered

ow-off after prime sand and prior to application of finish coat.



Tack-rag prior to finish coat. Note hanging arrangement for lids on work holder.

Finish coat reinforcing spray booth, just before parts enter electrostatic spray area

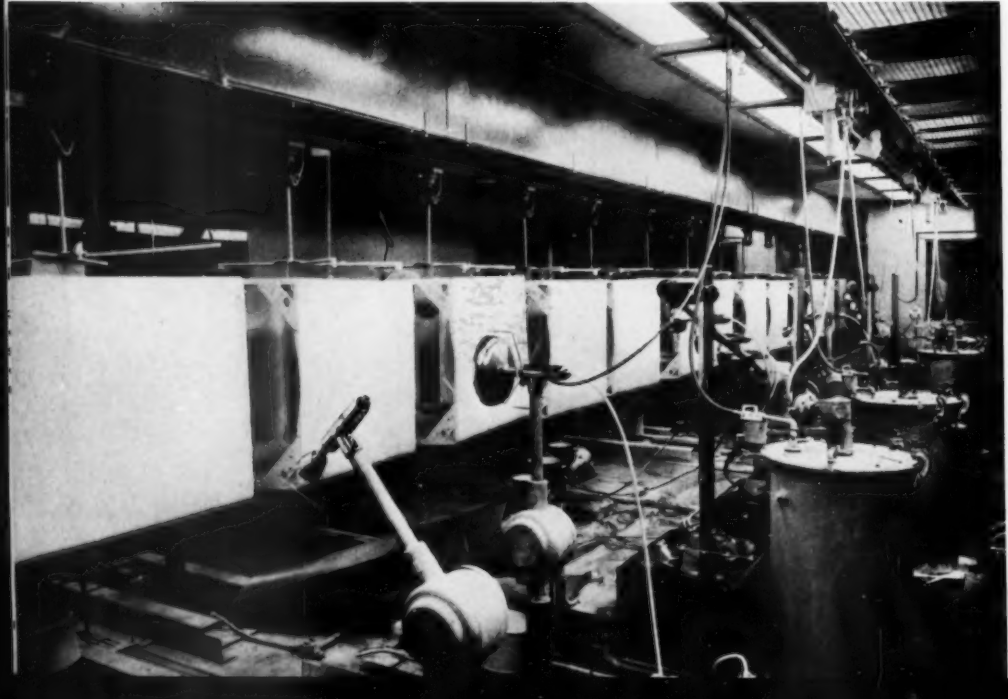
Control panel for both black and white paint systems.

to apply a one and one-third mil finish in a double pass, with a one minute flash off between. Then there is a five minute flash off before the pieces travel into the electric oven for baking at 320 degrees for 36 minutes. After baking, the finished parts travel to the finish inspection station; then are transferred with the black parts to the assembly conveyor.

Paint mileage was increased 84% in finishing washers. In Trenton where G.E. was producing 9.74 good automatic washers per mixed gallon of finish in the old plant, it was found possible at Appliance Park with all new equipment and the latest methods and materials to get 17.97 automatic washers with one gallon of finish and, where formerly 5.49 dryers were painted per mixed gallon of finish with former methods and equipment at Trenton, 9.56 good units per mixed gallon of finish were produced during the early months of 1954. This represents an increase of over 74%! Quality of the work was decidedly improved according to Thomas J. Snodgrass, superintendent of finishes, Major Appliance Division.

This G-E spokesman said that it was improved mechanization . . . additional conveyorization . . . electrostatic spray painting . . . closer quality control . . . that enabled the plant organization to increase paint mileage and maintain high quality standards in the production of washers and dryers . . . at less cost.

These two photos show the rack-stripping operation. Paint build-up on the fixtures is cleaned off when immersed in a molten salt solution at 900° F. Time required for the operation is only 10 seconds.



Spray booth where 1-1/3 mil finish coat is applied with electrostatic application equipment. The finish is applied in a double pass with a one-minute flash-off between passes.

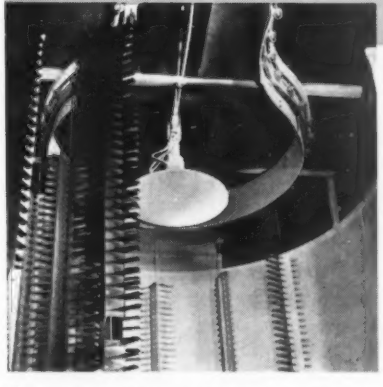
"One day we were using **14** hand sprayers ...the next day, **2**

"One day we were using **180** gallons of paint ...the next day, **75**

"Fantastic?" **Not exactly. It's a typical, on-the-job-example of the savings made possible with the**

RANSBURG NO. 2 PROCESS Electrostatic Spray Painting

And, in this instance* production was increased; quality of the work improved, and rejections cut to practically nothing.



*Fluorescent Fixtures of California, in their modern plant in South San Francisco, uses the Ransburg No. 2 Process Reciprocating Disc Atomizer to paint their popular line of ALL-BRITE lighting fixtures. The quotes above are from Works Manager, R. H. Shaffer.

Regardless of the type of product you manufacture, if it's painted ... and, if your production justifies conveyorized painting, you should look into the savings (and improved quality) which can be yours with one of the Ransburg Electrostatic Painting Processes. May we tell you about complete Ransburg services? Write to Dept. F.

Ransburg **ELECTRO-COATING CORP.**
Indianapolis 7, Indiana

RANSBURG

New Industry Developments

NEW PROCESS DESIGNED TO ELIMINATE CONVENTIONAL GROUND COAT FOR PORCELAIN ENAMELING

A NEW material, developed by Parker Rust Proof Co., is the key to a new method which allows the application of the porcelain enamel finish coat directly to ferrous metals, according to M. B. Roosa, vice president in charge of sales.

Field testing

After original development and testing in the Parker laboratories in Detroit, the new material, called Parker Pre-Namel 410, was ready for field testing in a production plant. This has been carried on for the past two years with the cooperation of Frigidaire Division of General Motors in their Dayton plant. Also collaborating in the field development has been Pemco Corporation, Baltimore, Maryland.

The new method has demonstrated that it delivers improved physical characteristics of the finished product, with important reduction in costs through by-passing the conventional ground coat and nickel flash steps, according to the producer.

The tests conducted indicate that the metal treatment provided by the process eliminates the need for a special premium base metal; applies successfully to cold rolled rimmed steel and enameling iron; permits application of standard finish coat porcelain enamels direct to steel; results in reduced coating thickness and produces completed parts meeting the best acceptance tests for standard porcelain enamel.

PEI torsion test

Torsion tests, one of the standard tests of the Porcelain Enamel Institute, show these average results in test reports: Conventional ground coat plus finish coat porcelain enamel on enameling iron angles fail when the metal is twisted 65 to 80°, while one finish coat of porcelain enamel, applied over Pre-Namel 410 on the same base metal withstands 3 to 3½ times more twist on the torsion test.

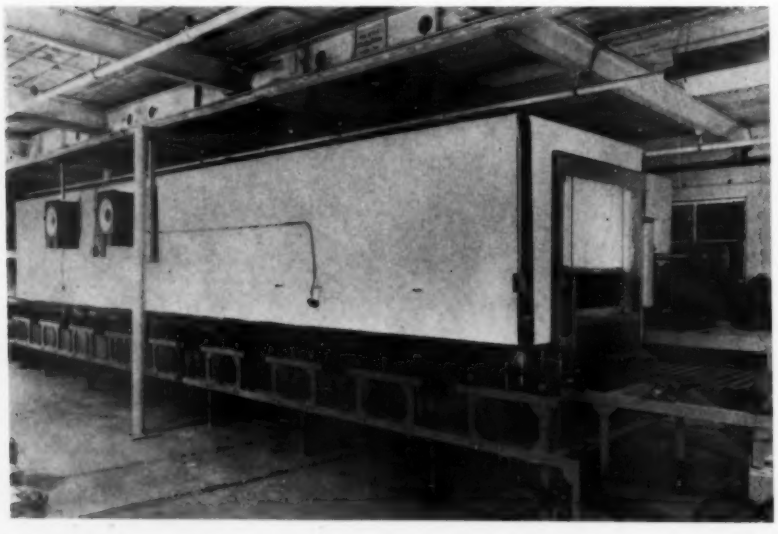
Application

Application of the new undercoating may be accomplished in automatic equipment and is easily and positively controlled, according to Parker officials.

See reduction in costs

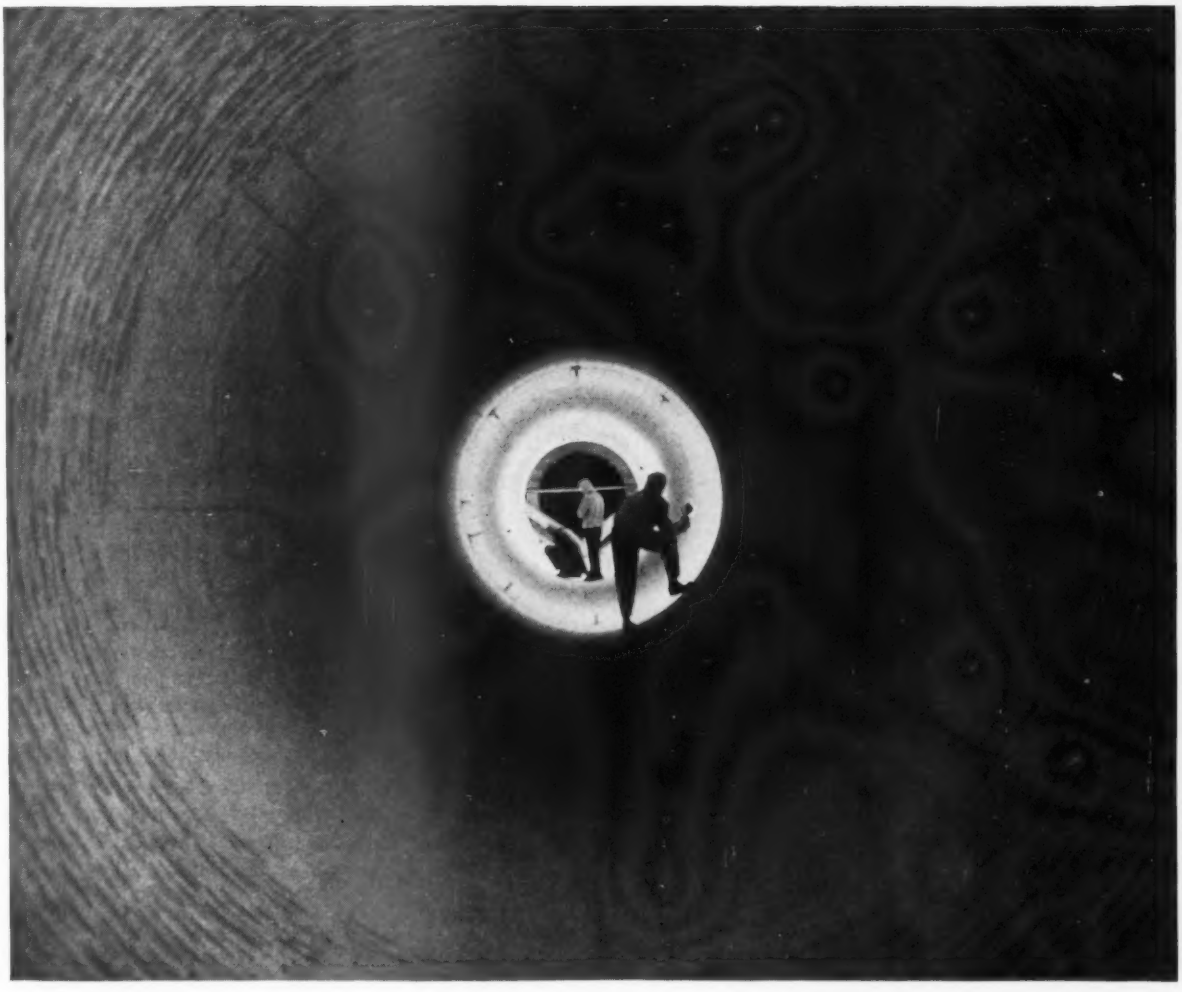
Summarizing, Parker officials state: "It is estimated that the use of Parker Pre-Namel 410 will result in a saving of from one to three cents per square foot of surface area enameled. Thanks to the cooperation we have had from Frigidaire Division of General Motors and Pemco Corporation in the development of this material and its method of application, its release to all industry will be speeded up tremendously."

NEW FURNACE FOR PORCELAIN ENAMEL ON ALUMINUM INSTALLED AT VIKON TILE PLANT



A new type of porcelain enameling furnace designed specifically for firing porcelain enamel on aluminum was recently installed in the plant of Vikon Tile Corporation at Washington, New Jersey. The new convection type furnace is electrically heated, has a stainless steel interior, two-zone heat control and is equipped with wire mesh belt conveyor. It has an overall length of 38 feet. It is designed to fuse the coating on aluminum at approximately 950 degrees Fahrenheit. Tile produced by Vikon Tile Corporation are 4½" x 4½" square. The production facilities are set up to produce 40,000 porcelain on aluminum tile per day with the one furnace unit. It is reported that the average bathroom can be surfaced with this type of tile (including mastic) with a weight addition of only 110 pounds.

The new furnace at the Vikon plant was built by Ferro Corporation.



bull's-eye for quality

The huge calciner shown here is just one part of the TITANOX quality story. In this mammoth rotary kiln, titanium hydrate is converted to titanium dioxide. It is one of the last steps in a carefully controlled process which yields the uniformity of composition, easy working qualities, low shrinkage and free flow which are characteristic of TITANOX-TG and TITANOX-TG-400—non-pigmentary titanium dioxides made exclusively for ceramics.

Smelted into titania porcelain enamels, TITANOX-TG produces maximum opacity while TITANOX-TG-400 yields a blue-white tone. Recent research indicates that glazes can be self-opacified by titanium dioxide through the use of TITANOX-TG. Further, TITANOX-TG is invaluable in promoting acid resistance in dry process enamels as well as enamels for aluminum and glass decorating. Both the anatase and rutile types of TITANOX titanium dioxide pigments are widely used as mill-added opacifiers.

Your TITANOX representative and our Technical Service Department are always ready to help you make the proper choice. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Atlanta 2; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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brightest name in the finish

TITANIUM PIGMENT CORPORATION

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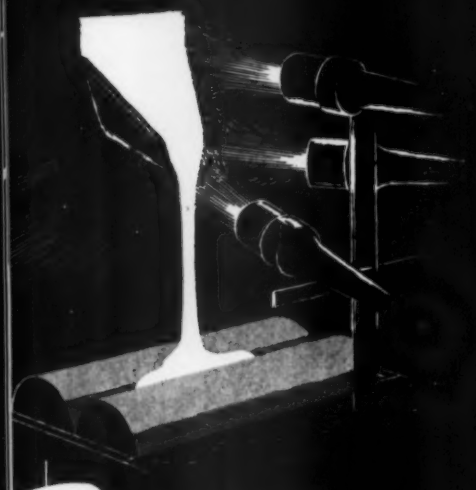
FERRO

1920 1955

A business grown big through SERVICE



1950

Ferro develops new Continuous Smelter producing "flake" frits by an ingenious roll quenching process.

1955

The new process revolutionizes P. E. industry, now accounts for two thirds of frit production.

FERRO CORPORATION

cleveland • nashville • los angeles

IN CANADA: FERRO ENAMELS, LTD., OAKVILLE, ONT.

ELECTRONIC UNITS TREAT INDUSTRIAL WASTES AT G-E

A $110,000 plant designed for treatment of industrial wastes prior to discharge is being operated by General Electric Company's electric housewares department plant at Allentown, Pa.

The new plant, capable of processing 100 gallons per minute, chemically treats the liquid wastes from the plant's metal plating operations. Electronic controls, developed by Minneapolis-Honeywell's industrial division, automatically regulate the amount of lime and caustic solution fed into the waste to neutralize it. Additional electronic and pneumatic instruments keep chart records of the chemical content and rate of flow of the wastes into the municipal storm sewers discharging to nearby Trout Creek.

The plant was designed by Gilbert Associates, Reading, Pa., in cooperation with the personnel from G-E's water management and waste control group.

SHEATHED CONDUCTORS FOR HIGH TEMP. APPLICATIONS

SMALL diameter sheathed conductors, applicable wherever high temperatures are to be measured and communication through high temperature zones is necessary, are being produced by Ferrod Mfg. Co., of Batavia, Ill., a subsidiary of Ferro Corp.

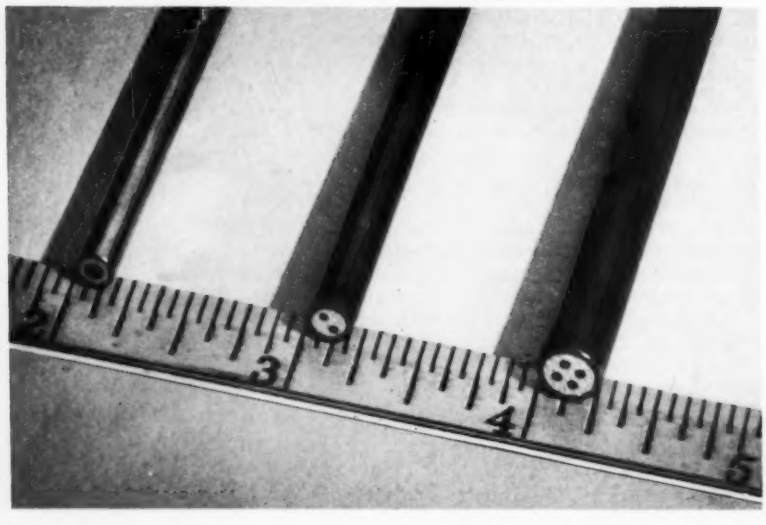
Developed for the government's jet engine program to operate in temperatures up to 2000° F. and to withstand highly corrosive gases, the sheathed conductors are now available to general industry for use as thermocouples, low voltage conductors and signal wiring.

As small as 1/8" in diameter, and made in lengths from 2 inches to 15 feet, the conductors consist of from one to six wires embedded in rock-hard crystalline magnesium oxide carefully positioned and encased in highly heat-resistant alloy tubing. Minimum spacing between wires and sheath, and between wires, is .035". Sheath wall thicknesses range from .015" to .050".

Since the sheathed conductors are fabricated to customer's specifications, the materials used for the wiring and sheathing vary and are determined by service requirements.

Each unit is thoroughly tested to assure proper insulation of the conductor in the sheath. Before leaving the Ferrod factory, 1000 volts are applied between each conductor and the sheath, and between individual conductors. Also, each unit must be above 1,000,000 ohms as measured on a 600 volt a.c to ground insulation resistance test.

Sheathed conductors as small as 1/8" in diameter function in temperatures up to 2000° F. and withstand highly corrosive gases.



BASEMENT BARGAIN for Paint Finishing

NOW P-D ENGINEERING—CONSERVES floor space... UTILIZES basement areas for disposition of paint laden air . . . RETURNS washed and filtered air.

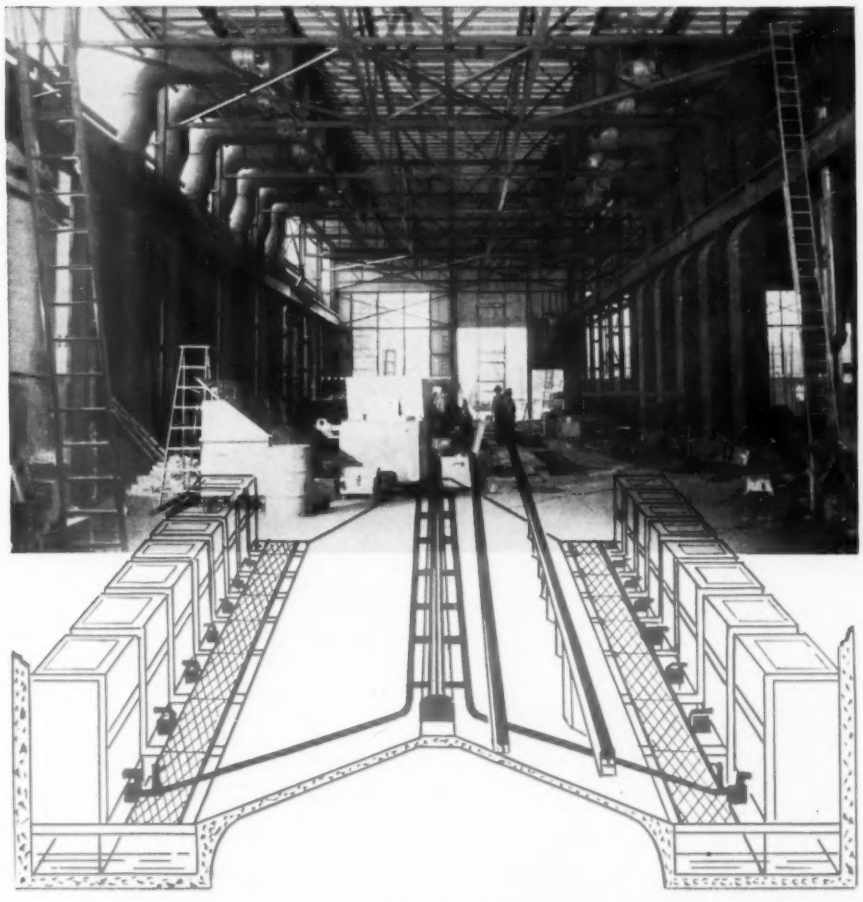


Photo (while under construction) and Drawing of P-D Finishing System above illustrate (1) the complete freedom of movement without loss of any floor space, and (2) the elimination of expenditure for air make-up because of cleansed air-return feature of this installation.

This new installation of a Peters-Dalton Hydro-Whirl Finishing System in the plant of a major manufacturer of milling machines has overcome many serious problems. In this case, dirty, inefficient, and dangerous conditions otherwise thought insoluble have been overcome. The machines made here are of huge size (castings weighing up to 90,000 lbs.) and handling operations must necessarily be held to a minimum. Complete finishing operations now can be carried on by any number of men — working on all sides of the machines — in unpolluted air. The Finishing System engineered and built by Peters-Dalton permits the placing of these machines in a room fitted with floor gratings. The paint laden air (over 150,000 CFM) is drawn down through these gratings to a lower level and thence through the P-D washer sections, where it is "knocked down" by the Hydro-Whirl scrubbing action which returns it washed and filtered to the finishing room. It is a finishing system that not only solves the problems of a particular manufacturer but is so excellent that it meets insurance company standards and code requirements of most states for the return of cleansed air to a room.

Finishing Systems by Peters-Dalton are designed for the job — to do the job. Whatever your needs . . . from cabinet size to installations comparable to the one illustrated here . . . depend upon P-D designing and engineering. If you want to modernize, economize, increase production and efficiency, we'll be glad to tell you more. Just write, wire or phone.

Representatives in Principal Cities

P-D Peters-Dalton INC.
17890 Ryan Road • Detroit 12, Michigan

- *Hydro-Whirl Paint Spray Booths*
- *Industrial Washing Equipment*
- *Drying and Baking Ovens*
- *Hydro-Whirl Dust Collecting Systems*

Q.

why does PEMCO "Custom Tailor" its PORCELAIN FRIT?

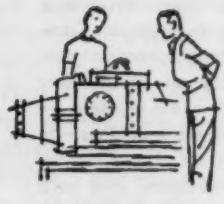
A.

to make your product SELL!

Whether you're putting the "skin" on metal buildings

. . . the "glass-lining" in hot water heaters

. . . the "lifetime wear" into appliances



. . . or extending the life of jet engines

here's why . . .

The old adage, "Clothes make the man" is true. Many times the impression you get of a man depends upon the *kind* of clothes he wears. The same is true of your *products*. That's why Pemco builds into its frits the exact protection your products need to withstand severe exposures . . . to increase salability by creating the utility value and beauty your customers want. That's why Pemco frits are "custom formulated" to provide built-in protection against weather and wear, corrosive liquids, alkalies and strong detergents or Atomic Age heat . . . depending on your needs. It's that lasting finish your customers grow to expect—don't let them down. Write for information and recommendation of the Pemco frit tailored to put "sell" in your product.

CORPORATION • BALTIMORE 24, MARYLAND

Manufacturers of "*The World's Finest*" Porcelain Enamel Frits for steel, cast iron and aluminum; Coloring Oxides; Screening Pastes; Glaze Frits; Body and Glaze Stains; Underglaze and Overglaze Colors; Vitrifiable Glass Colors.

BRITTAIN, LANGENHAN TO AMERICAN KITCHENS

Two executive appointments at American Kitchens Div., Avco Mfg. Corp., Connersville, Ind., have been announced by Curry W. Stoup, general manager.

William J. Brittain has been named advertising manager, succeeding H. T. Stroop, resigned. Robert Langenhan has joined the division as assistant controller.

MIDWEST MFG. WAREHOUSE ADDITION

Construction has been started on a new 45,000 square foot addition to the main warehouse of Midwest Mfg. Corp., Galesburg, Ill., subsidiary of Admiral Corp. The plant produces electric ranges, home freezers and refrigerators and will begin production of room air conditioners this fall.

CROSLEY & BENDIX MERGE MANAGEMENT OPERATIONS

Avco Mfg. Corp.'s Crosley and Bendix Home Appliances Divisions will unify management operations, it has been announced by Chester G. Gifford, president of the divisions. The electronics division will be merged with the appliance and laundry divisions.

F. E. Howell, vice president, becomes vice president of sales and distribution. D. B. Blatz becomes general controller, a new position. W. A. MacDonough, general manager of distribution and merchandising, becomes director of advertising and sales promotion for consumer goods. John Mihalic has been named director of manufacturing and engineering.

SCHAEFER IS FLORENCE STOVE MIDWEST DIVISION MANAGER

The Florence Stove Co., Chicago, has announced the appointment of Bert Schaefer as midwest division manager, replacing F. O. Blake, resigned.

Schaefer, formerly appliance sales manager for Admiral Corp., will headquarter in Chicago.

AMANA NAMES PEARCE HEAD OF SALES TRAINING

Appointment of Robert I. Pearce as director of sales training for Amana Refrigeration, Inc., Amana, Iowa, has been announced by E. L. Hinchliff, sales manager.

At one time Pearce was sales training manager for Crosley Div., Avco Mfg. Corp.

HOTPOINT COMPLETES 10-YEAR EXPANSION PROGRAM; OPENS NEW HOME LAUNDRY PLANT

The formal opening of Hotpoint's new home laundry factory in Chicago marked the completion of a plant expansion program aimed at a 10 year projection of sales to double sales volume. The new plant makes automatic washing machines and clothes dryers.

PERFECTION NAMES WRIGHT APPLIANCE SALES MANAGER

Perfection Industries, Inc., Cleveland, has announced that its appliance and furnace sales divisions will be headed by Donald G. Wright as general sales manager. He assumes the duties of J. H. Rasmussen, who retired as vice president and director of appliance sales.

Phillip J. White has been named sales manager of the refrigeration contract division.

AUGENSTEIN HEADS G-E AIR CONDITIONER DEPT.

P. M. Augenstein has been appointed general manager of the room air conditioner dept. in General Electric Co.'s Major Appliance Div., Louisville, Ky., C. K. Rieger, vice president and division general manager, has announced. Augenstein succeeds H. B. Miller, who has been named general manager of the home laundry dept.

WM. S. RHEEM II NAMED RHEEM DIRECTOR AND VICE PRESIDENT

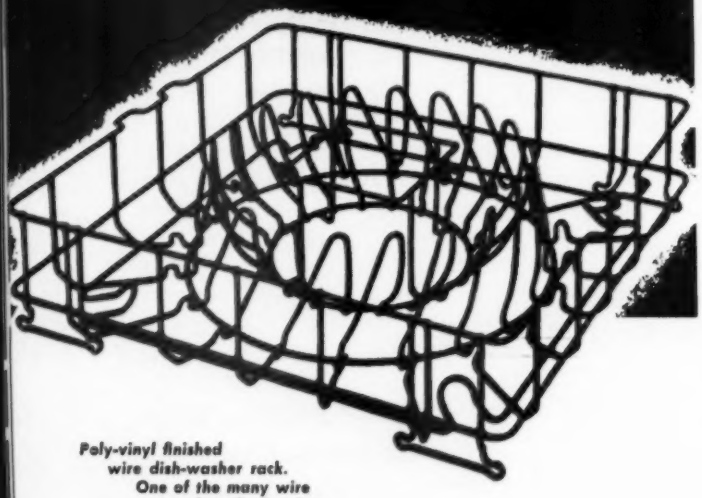
William S. Rheem II, general manager, Rheem Mfg. Co., Chicago, has

been elected to the board of directors and named a vice president, it was announced by president, R. S. Rheem.

He became assistant general manager in 1953. A year and a half ago he was named general manager in charge of the company's four operating divisions.

EVER SEE

A Picture of Know-how...



Poly-vinyl finished wire dish-washer rack. One of the many wire products by Peerless.

Illustrated above is one of the many reasons why PEERLESS has long been known as one of the quality manufacturers of formed wire products. Intricate forming of low carbon steel, resistance welded at all points of contact, and quality finishing tells the story of craftsmanship. Here is a product of the highest calibre for appliances of quality.

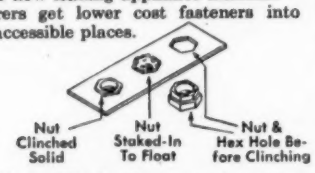
Here, too, is the reason PEERLESS names among its customers many outstanding manufacturers of home appliances. If your requirements are for freezer baskets, refrigerator trays, dish washer racks or any of the hundreds of wire formed products, PEERLESS has the engineering, facilities and years of know-how to transfer your designs from drawing board to finished product . . . from zinc plate to organic and poly-vinyl finishes. And, PEERLESS can do it better, faster, at less cost. *Send us your prints for quotations by return mail.*

Peerless WIRE GOODS COMPANY, INC.
2703 FERRY STREET
LAFAYETTE, INDIANA

use these
GRIPCO CLINCH NUTS
with the exclusive
hex on hex
feature

for "fixed" fastenings for "hard-to-reach" or blind assemblies. They wear longer, hold tighter, give greater customer satisfaction.

See how leading appliance manufacturers get lower cost fasteners into inaccessible places.



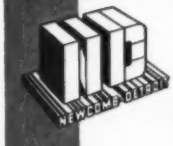
Gripco Clinch Nuts can be either clinched solid for a rigid application or staked in with a six point staking punch to give a floating effect. This floating effect takes care of misalignment and makes the application of the bolt easier. Gripco clinch nuts can be clinched or staked with stationary or portable hydraulic or air equipment. Details on request. Write for samples and data sheet.

Typical Applications

GRIP NUT COMPANY 113
308-Q S. Michigan Avenue, Chicago 4, Illinois

NEWCOMB-DETROIT

PIONEERS IN ENGINEERING, MANUFACTURING & INSTALLING OF



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TR 3-2100

EASY WASHER, UNION CHEMICAL PLAN MERGER; MURRAY TO TAKE OVER APPLIANCE BUSINESS

The directors of Easy Washing Machine Corp., Syracuse, N.Y., have approved a merger with Union Chemical & Materials Corp., Pittsburgh, Pa., and also an agreement with Murray Corp. of America, Detroit, whereby Murray would buy Easy's appliance business and goodwill.

Under the plan, the Easy firm would go out of existence, but the other two companies would continue operations in Syracuse, with Union Chemical taking over Easy's defense work.

The proposed transaction with Murray is contingent upon the proposed merger with Union Chemical, according to W. Homer Reeve, Easy president. If both transactions are approved, Easy's Syracuse plant would be operated by Union Chemical as its Syracuse division, with Reeve acting as division president. It was indicated that the contract also provides for Murray to make Easy products in the plant.

B. C. Gould, Murray president, said the transaction would give his company an established national marketing organization for home laundry appliances which it has developed and which are ready to go into production. The acquisition would be another move by Murray under its diversification program.

Magic Chef's 7,000,000th gas range *— has been designated for "Mrs. America" by Cecil M. Dunn, president. Marking the occasion are Dunn (left), and Philip A. Foppe, oldest plant employee in the point of service. The 63-year-old Foppe, order clerk in the repair department, has been with Magic Chef for 46 years, the last 44 consecutively.*

New Sales Feature

REQUIRES NO RETOOLING

COSTS ONLY PENNIES

MP-252, for primary circuit protection for 15-, 20-, and 30-amp. circuits. Acceptable on all Underwriter's Listed equipment.

Here's the new sales feature you've been looking for! Handsome, neat, compact and rugged, the MP-252 is engineered with single-hole mounting for high-speed application. Its easy, rapid installation can mean big savings in assembly costs, with a *plus* sales feature that your customers will be sure to go for.

Attractive pushbutton feature is trip-free . . . restores service within 10 seconds . . . yet will not maintain a circuit that has not been cleared.

MINI-BREAKER®

Made by one of the world's largest manufacturers of circuit breakers for aircraft, industrial and consumer use.

Write today for *new catalog* and detailed information

Mechanical Products, Inc.
Dept. B6, Jackson, Mich.
Please send new catalog and detailed information about Mini-Breakers for use with (describe equipment)

_____

_____

Name_____ Title_____

Company_____

Street_____

City_____ Zone_____ State_____

2

NORGE 6-MONTH REFRIGERATOR SALES EXCEED ALL OF 1954

Refrigerator sales to Norge dealers for the six months ending June 30 doubled those for all of 1954, reports R. C. Connell, vice president of sales, Norge Div., Borg-Warner Corp., Chicago.

"For the first five months distributors registered increases ranging up to 284% above 1954", he said.

BEAM ADDS TO PLANT SPACE; NAMES LEISEY GEN. MGR.

The Beam Mfg. Co., Webster City, Iowa, has moved into a new addition providing for a 30% increase in floor space. The company was recently acquired by Franklin Mfg. Co., Minneapolis.

George Castner, past president of the American Home Laundry Manufacturers Association, has retired as general manager to serve as chairman of the advisory committee, and Harold Leisey has become general manager.

FLORENCE STOVE NAMES PUTMAN VICE PRESIDENT

Announcement has been made by Robert H. Taylor, president, Florence

Stove Co., Chicago, of the appointment of Robert D. Putman as vice president. Putman will be in charge of sales for the Florence range and the Quaker heating divisions.

P. Costomiris has been appointed sales manager of the Quaker heating division.

PREWAY BUYS FEDERAL PRODUCTS DIVISION

Preway, Inc., Wisconsin Rapids, Wis., has purchased the Federal Products Div. of the Federal Malleable Co., Milwaukee, announced J. O. Ellis, Preway president.

The sale includes patent rights to the electric heaters produced by Federal.

VACUUM CLEANER SALES UP

Factory sales of standard-size household vacuum cleaners in April amounted to 244,143 units, up 10.5% from 220,849 sold in April, 1954, according to the Vacuum Cleaner Manufacturers' Association.

A Gear Motor for
SMALL APPLICATIONS

Our line of small induction motors is designed for applications where small power can be converted to considerable torque at slow output shaft speed. Hundreds of thousands are in use today for operating relays, vending, amusement, coin operated machines, motion displays, combination rotisserie and broilers, etc.

These motors are made in three basic sizes—speeds from 1 to 200 r.p.m. with proportional torque from 5 to 500 in. ounces. Write today for descriptive information, prices and data sheet.

MOTORESEARCH COMPANY
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RACINE, WISCONSIN

Designers and Manufacturers of
SPECIAL INDUCTION MOTORS

MOULDING CLIPS? Get prices from Cuyahoga!

We also make Springs, Stampings, Stud Clips, Screw Fasteners, and Special Cold Headings.

Contact your Cuyahoga representative

One of the 16 Integrated Companies BARIUM Steel Corporation

The CUYAHOGA SPRING Co.
10270 BEREA ROAD • CLEVELAND 2, OHIO

Embarrassed? Man, I could cry!

"One day the Detrex man mentioned that metal cleaning and surface preparation represented from ¼ to ⅓ of the operations in most metalworking plants. Well sir, I just didn't believe him and took a count to prove him wrong—only I didn't! In fact when I think of the money I lost because I paid so little attention to the importance of these operations, I could really cry.

"In our plant over a quarter of the operations performed fell into one of these two categories. As a result, this metal cleaning business represents big money to us every year—even small savings on each operation represents mighty big savings overall. And mister, Detrex cut our costs on nearly every one.

"Take our phosphate coating operations prior to painting as an example. Detrex Paintbond* is saving us hundreds of dollars per year because it goes so much further. At the same time Paintbond gives us a finer crystalline coating and thus a smoother, more lustrous paint finish. Salt-spray tests? . . . better than ever.

"If you've never stopped to count the number of metal cleaning and surface treatment operations in your plant (or the money you might save on them) chances are you'll be shocked.

"Tell you what—the Detrex man in your territory will make the same kind of a survey in your plant. Why not give him a crack at it? You don't owe him a plugged nickel if he doesn't prove his point. What if he does?, you ask. Then he'll sell some chemicals and/or equipment and you'll save BIG dollars. How about giving it a whirl, today? You have everything to gain, nothing to lose."

Above is shown the attractive three-color label which Detrex provides to users for application on finished products. At point-of-purchase, this label tells your customers that your product has a durable finish that will give a life time of pleasure. It's an added sales clincher every time.

Service with a Saving!

DETREX CORP.

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DEGREASERS • DEGREASING SOLVENTS • WASHERS
ALKALI & EMULSION CLEANERS • DRYCLEANING
EQUIPMENT • PHOSPHATE COATING PROCESSES

VACUUM CLEANER SALES UP

Factory sales of standard-size household vacuum cleaners in May totalled 261,238, up 24.7% from 209,434 in May, 1954, and 7% higher than 244,143 sold in April, 1955, according to the Vacuum Cleaner Manufacturers' Association.

FRIDEN NAMES RENHOLTS FACTORY MANAGER

Roy C. Renholts has been named factory manager of the Friden Calculating Machine Co., Inc., San Leandro, Calif. Production manager for the past ten years, Renholts succeeds Dunstan S. Gross, who earlier this year was named vice president in charge of research engineering.

KELVINATOR SALES RISE

For the 1954-55 fiscal year, total Kelvinator appliance billings to dealers through May 31 were 25% ahead of the first eight months of fiscal 1954, announced Walter Jeffrey, vice president in charge of sales, Kelvinator Div., American Motors Corp., Detroit. Total billings for May were 40% greater than May, 1954.

WESTINGHOUSE APPOINTS IRVINE

Appointment of A. S. Irvine, Jr., as manager of sales training for

major appliances has been announced by R. J. Sargent, manager of major appliances for the Westinghouse Electric Appliance Div.

ARI PREDICTIONS

The air conditioning industry will create about 400,000 more jobs for American workers by 1960, an industry spokesman predicts.

George S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute, based his prediction on estimates that the air-conditioning industry will double its output during the next five years.

NARDA PLANS APPLIANCE-TV DEALERS MGMT. INSTITUTE

Arrangements have been completed with Dean Nathan Bailey of the School of Business Administration, The American University, Washington, D.C., for an Institute of Management for Appliance-TV Dealers under the sponsorship of the National Appliance and Radio-TV Dealers Association, NARDA president, H. B. Price, Jr., has announced.

The Institute will be conducted August 14-20, and only 50 dealers will be permitted to participate in it this year.

CENTRAL ENAMELERS TOUR NEW WESTINGHOUSE PLANT

The Central District Enamelers Club recently visited the new Columbus, Ohio, plant of Westinghouse Electric Corp.

At a meeting in the plant's auditorium, C. D. Heaton, manager of manufacturing, explained to the 65 enamelers present some of the details of the expansion program and the growth of Westinghouse over the past few years, as well as what is planned for the years ahead.

Colored slides were then shown of Westinghouse appliance division plants, and also of some of the interesting operations being performed in the Columbus plant.

Following a plant tour, dinner was served in the plant cafeteria where election of officers was held. The new officers are:

President, Herbert Lindegger, Westinghouse; 1st v.p., Wm. Rode, Enamel Products; 2nd v.p., Paul Thompson, Whirlpool; 3rd v.p., Melvin Mullis, Newark Stove; sec.-treas., Mike Bozsin, Berro; and asst. sec.-treas., Fred Allenbaugh, Ferro.

The club's next meeting will be their annual golf outing to be held Saturday, September 10, at the Sunset Golf Club, Mt. Vernon, Ohio.

Some of the 65 enamelers who toured the Columbus, Ohio, plant of Westinghouse Electric Corp.

With O. HOMMEL ceramic products you are always assured of highest quality and perfect uniformity! When planning improved quality control always call O. HOMMEL COMPANY

For successful and profitable production, you are always assured of quality control with Hommel ceramic supplies. Hommel maintains modern, complete engineering and research facilities in order to develop and offer supplies that reflect the latest ceramic developments and changing demands of ceramists. Give comparative tests and see for yourself that Hommel can help your products. You'll find that experience, modern equipment and research does make a difference.

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Our Technical Staff and Samples are available to you without obligation. Let us help with your problems.

THE O. HOMMEL CO. PITTSBURGH 30, PA.

"The World's Most Complete Ceramic Supplier"

West Coast Warehouse, Laboratory and Office, 4747 E. 49th Street, Los Angeles, California

PERMAGLAS IN HEATING FIELD

C. L. Hewitt, Jr., manager of heating products, will be responsible for all the integration and programming of an entry into the heating field by Permaglas Div., A. O. Smith Corp., Kankakee, Ill., announced J. H. Brinker, division manager.

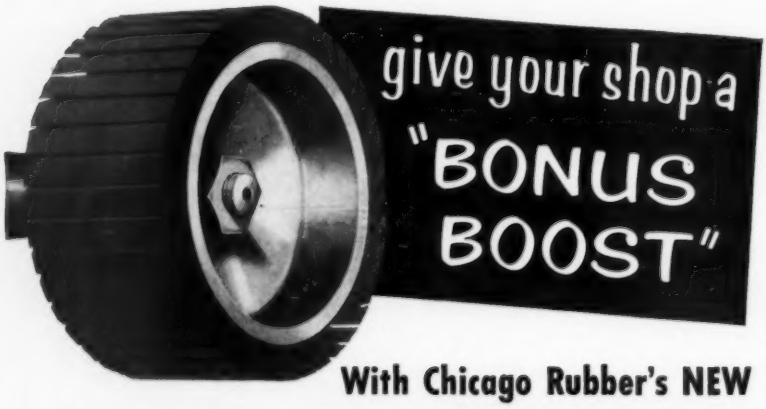
TOASTMASTER SALES INCREASE

A 54% increase in Toastmaster dollar volume for the first four months of 1955 over the first quarter of 1954 has been reported by W. E. O'Brien, vice president, Toastmaster Products Div., McGraw Electric Co., Elgin, Ill.

Unit sales for the first four months of this year were 62% ahead of the 1954 comparable period.

FENDYA HEADS MAGIC CHEF'S INDUSTRIAL RELATIONS DEPT.

John J. Fendya, who has served with Magic Chef, Inc., St. Louis, Mo., for 18 years, has been appointed director of the newly created industrial relations dept., it has been announced by Cecil M. Dunn, president.



With Chicago Rubber's NEW

COSMO EXPANDER WHEEL

You'll get faster grinding • Better work
Longer belt life • Easier trouble-free performance
Instant abrasive change • No down time

Cosmo Expanders up to 2" diameters available with ¼" mandrels for hand tools. Larger sizes up to 8" diameters—arbor hole type only. Specials to your specifications.

This brand new slotted rubber Cosmo Expander wheel cuts down high shop costs and valuable time. It's easier to operate and will allow you to get all the usable life out of your abrasive bands and sleeves. To change bands—no tools necessary. Slip it on and the centrifugal force exerted by this wheel holds the abrasive element tightly with no possibility of slipping—replacement becomes a matter of seconds. And what's most important, you will instantly notice a vast improvement in quality—the higher degree of resiliency in the Cosmo Expander will give you the best work you've ever done. You can't miss. Write for descriptive literature today.

"REMEMBER, IT'S THE WHEEL THAT DOES THE WORK"

CHICAGO RUBBER COMPANY, INC.

2020 CLYBOURN AVE. • CHICAGO 14, ILLINOIS

AMERICAN MOTORS NAMES HURD ASST. TREASURER

Robert C. Hurd, Jr. has been appointed assistant treasurer of American Motors Corp., Detroit. He continues as assistant secretary of the corporation and manager of credit and collections for the Kelvinator Div.

NORGE PLANS VACATIONS FOR TOP DEALERS

Norge started on July 1 to save vacation money for appliance dealers — enjoyable in January, 1956, in Puerto Rico or Mexico City.

The plan, recently announced at a distributor meeting, is a second phase in the multi-million dollar dealer incentive program, according to R. C. Connell, vice president of sales, Norge Div., Borg-Warner Corp., Chicago.

MAGIC CHEF UPS NEWKIRK

Paul R. Newkirk, heater sales manager of the Central Sales Div. of

Magic Chef, Inc., St. Louis, has been promoted to merchandising manager of the Space Heater Div., it has been announced by Kenneth O. Dupree, Magic Chef general sales manager.

GAS FURNACE SHIPMENTS SET TWO NEW RECORDS

Gas-fired warm-air furnace shipments during May set an all-time high for the first five months of the year and a new record for May ship-

ments, according to the Gas Appliance Manufacturers Association.

Edward R. Martin, director of marketing and statistics, reported that 281,600 units were shipped to dealers and distributors during the first five months, an increase of 44.7% over the same period in 1954. Shipments in May totalled 66,900 units, a gain of 34.6% over May, 1954.

HEINTZ MFG. ELECTS GRACE PRESIDENT

Charles B. Grace, vice president and secretary-treasurer of the Heintz

Mfg. Co., will become president of the company, effective August 1, the board of directors has announced.

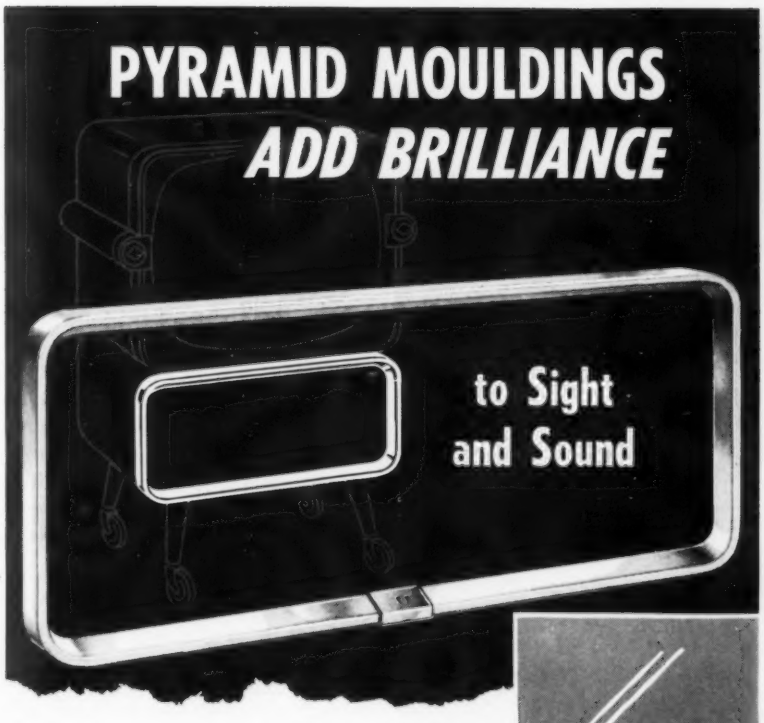
William J. Meinel, president since 1932, will continue as chairman of the board, a post he has held since 1943.

Grace has been a director since 1936. He was elected first vice president in 1937, treasurer in 1939 and secretary in 1941. He will retain his post as treasurer but is relinquishing his post as secretary to John H. Thacher, manager of quality control and son of Frank W. Thatcher, one of the company founders.

MAY GAS RANGE SHIPMENTS UP

Edward R. Martin, Gas Appliance Manufacturers Association, director of marketing and statistics, has reported that during May 175,100 ranges were shipped to distributors and dealers, compared to 163,800

PYRAMID MOULDINGS
ADD BRILLIANCE
to Sight and Sound



Here is a custom formed bezel made for a world famous television manufacturer.* Created for added beauty, function and continuity of shape, this *one-piece, roll formed moulding* carries thru the smart styling of the viewing screen to the speaker compartment.

Regardless of your moulding application — whether to *add sales appeal* to television sets, functional frames to air conditioners, or decorative bezels to oven doors . . . Pyramid's two complete plants are at your service. Write today for your "Plan Book of Metal Mouldings." *Name on request.

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SEND FOR YOUR FREE COPY OF "PLAN BOOK OF METAL MOULDINGS"

No one connected with the design or manufacture of any appliance should be without a copy of this book containing hundreds of standard and special mouldings. Send for your free copy today.

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Name_____ Title_____

Firm_____

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FERRO

1920 1955

A business grown big through SERVICE

1951

Ferro promotes Porcelain enamel for Curtain Wall Construction in Architectural Forum.

1955

Ferro sponsors big Architectural Competition to stimulate even greater use of P. E. in the building field.

FERRO CORPORATION

cleveland · nashville · los angeles

IN CANADA: FERRO ENAMELS, LTD., OAKVILLE, ONT.

shipped during May, 1954, an increase of 6.9%.

This makes a total of 913,100 ranges shipped during the first five months of 1955, at 12.1% increase over the same period in 1954.

GAS WATER HEATER SHIPMENTS SET FIVE-MONTH RECORD

Automatic gas water heater shipments for the first five months of 1955 showed an all-time high of 1,178,000 units, an increase of 27.5% over last year, according to the Gas Appliance Manufacturers Association.

Edward R. Martin, director of marketing and statistics, reported that May shipments were the highest on record for that month with 230,400 units, a 17.8% increase over last year.

G-E'S LANG RETIRES

Chester H. Lang, vice president of public relations, General Electric Co., Schenectady, N. Y., retired July 1, after more than 36 years with the company.

SULLIVAN TO WESTINGHOUSE LAUNDRY MERCHANDISE POST

The appointment of Kevin J. Sullivan as merchandise manager for

Westinghouse laundry equipment has been announced by Jack D. Lee, manager of the department for Westinghouse Electric Appliance Div., Mansfield, Ohio.

***Soon after this millionth sink unit**—rolled off its assembly line, the American Kitchens Division of Avco Mfg. Corp., Connersville, Ind., shipped it to Chicago for display with its wood and copper Pioneer Line kitchen exhibited at the Merchandise Mart. Holding the sign proclaiming the millionth sink are Curry W. Stoup (left), Avco vice president and general manager of American Kitchens, and C. Fred Hastings, general sales manager.*

CRANE CELEBRATES A "CENTURY OF ACHIEVEMENT"

A "century of achievement" that parallels the advance of industry and living conditions in the United States over the past 100 years is being reviewed and celebrated this year by Crane Co., Chicago.

Crane Co. has its beginning on July 4, 1855, when Richard Teller Crane, 23, opened a one-man, self-built frame shop in Chicago, a bustling city of 75,000 persons. At that time there was no plumbing industry to speak of, very little valve and fitting business, and only a primitive heating field.

FRANK ELLIOTT, CRANE PRESIDENT

In the R. T. Crane Brass & Bell Foundry, as the company was originally called, young Crane first produced brass couplings and copper tips for lightning rods, articles much in demand in those days.

The company became a manufacturer of valves and fittings, making its own castings. In a few decades it took seriously to the science of metallurgy. In the 1920's it began the manufacture of plumbing fixtures and a few years later pioneered color in these fixtures.

Today Crane makes thousands of products. A basic list includes valves, fittings, fabricated piping and piping accessories, plumbing fixtures, plumbing brass trip, heating equipment, kitchen cabinets and accessory equipment for aircraft. The company has just gone into the production of titanium sponge and ingots at a new plant in Chattanooga, Tenn. Other Crane plants are located in Chicago, Ill.; Trenton, N.J.; Colton, Calif.; Montreal, St. Johns, Port Hope, Calgary and Quebec, Canada; and Ipswich, England.

Frank F. Elliott, senior vice president of sales since 1952, was recently elected president and chief executive officer of Crane, succeeding John L. Holloway, resigned.

A look ahead at appliance sales

(Continued from Page 31)

ing field. Yet, many dealers are still reluctant to commit themselves in a color program in appliances. However, we feel educational programs will make dealers conscious of this new sales opportunity. Manufacturers have conducted exhaustive surveys to determine consumer color preferences and it appears that aggressive programs by manufacturers, distributors and dealers will be necessary to dramatize this merchandise.

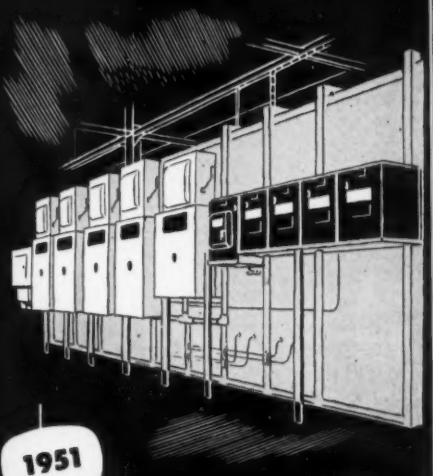
Air conditioning unit sales 2,500,000 by 1964

The appliance industry expects the air conditioning business to develop substantially in the future. This new business has gone through growing pains, which was apparent last year when emphasis was on production without the necessary marketing controls. This situation has now been corrected. Although industry sales in 1955 are expected to be 5 to 10 per cent under those of 1954, due to excessive production last year, we look for steady increase over the years. For example, we predict industry unit sales to be 2,500,000 by 1964 as compared with 1,230,000 in 1954.

Evidence of strong industry growth is seen in these figures: in 1952, about 9,500,000 appliance units were sold. In 1954, there were 11,200,000. In 1955, estimated sales will be nearly 12,000,000 and, in 1964, we expect sales to increase 80 per cent over 1954.

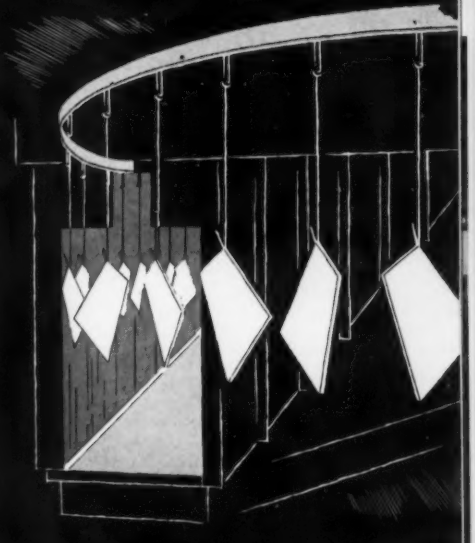
Adapted for finish from a press conference statement, Merchandise Mart, Chicago, June 21, 1955.

FERRO
1920 1955
A business grown big through SERVICE



1951
Ferro builds first gas-fired, controlled-zone P. E. furnace for better, more uniform production.

1955
New devices provide absolute temperature control in every part of a Ferro furnace.



FERRO CORPORATION
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IN CANADA: FERRO ENAMELS, LTD., OAKVILLE, ONT.

Earle M. Mackey
Washington Stove

R. W. McMahon
National Homes

S. E. Smalling
American Kitchens

Sam L. Cohn
Colonial Alloys

L. W. Shaw
Preway

Samuel Duncle
IAM managing di

James Underwood
Eagle Stove

John Knighton
Crosley

F. H. Martin
Martin Stamping

Kenneth Cook
American Kitchens

Walter Muhlbach
IAM past president

Pauline Duncle
IAM exec. secret

H. M. Helferich
Harvey Spring

C. E. White
Mechanical Prod.

Candid finishfotos From The Institute Of Appliance Manufacturers' Annual Convention

(read IAM report in July issue of *finish*)

Tom Armel
Glidden

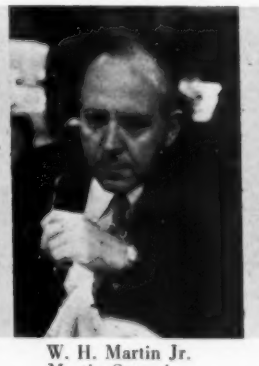
A. G. Feldmeir
Marsco

Vincent Veno
asst. to IAM mg. dir.

W. P. Hoffman
Allen Products

Henry H. Morse
IAM president emeritus

R. O. Duerwachter
Jungers Stove



W. H. Martin Jr.
Martin Stamping

Howard Johnson
Motoresearch

E. P. Robinson
Avon Tube

F. A. Weaver
Tappan Stove

John McCord
Ferro

Marc Pender
American Kitchens

Joseph Guertin
Crosley-Bendix

Al Pinder
Avon Tube

Look beneath the surface

IC Flash Primer

STOPS ADHESION PROBLEMS ON PHENOLIC PLASTICS

When your molded phenolic products go to market—their finish will most likely make the difference between a sale or . . . no sale! IC's #8212 Flash Primer offers you a combination of superb adhesion, toughness, and resistance to peeling, chipping and blistering—that boosts sales-power.

Due to their hard, impermeable surface and insolubility in organic solvents, phenolic molded plastics present a *real* adhesion problem. Where other primers fail, #8212 Flash Primer *sticks*—and it can be flashed in a few seconds to a few minutes, depending on production conditions. Followed by a top-coat of POLYMERIN®, a mono-bake system is provided—with a hard, marproof, protective finish of exceptional beauty.

Very likely you have finishing problems where #8212 Flash Primer can be of great help. It is just one more example of how Interchemical Inter-Related Research helps progressive manufacturers make good products *better* products.

Consult your nearest IC Finishes specialist for complete details.

Interchemical
CORPORATION
Finishes Division

Factories: Chicago, Ill. • Cincinnati, Ohio • Elizabeth, N.J. • Los Angeles, Cal. • Newark, N.J. • Mexico City, Mex.
In Canada, IC products are sold by AULCRAFT PAINTS LTD., Toronto, Ont., under its trademarks.

NEWS ABOUT SUPPLIERS

ARMCO BUYS FABRICATING & WAREHOUSING FACILITIES

Armco Steel Corp., Middletown, Ohio, has completed the purchase of the Middletown facilities of Warren Steel Corp., Armco president W. W. Sebald announced. The plant and office buildings have approximately 40,000 square feet of working space and will be used to house Armco's fabricating and warehousing operations.

DRAKE IS PENNSALT PRESIDENT

Executive vice president William P. Drake succeeds George B. Beitzel as president of Pennsylvania Salt Mfg. Co., Philadelphia.

Beitzel will continue as a member of the board and as chairman of the board and as chairman of the board of Pennsalt International Corp., a subsidiary. He joined the company in 1930 as a product sales manager and became chief executive in 1949.

At 42 years of age, Drake is the youngest president in Pennsalt's 105-year history, and with 21 years' service prior to assuming office, will have longer company experience than all but one of his thirteen predecessors.

JONES & LAUGHLIN APPTS.

It is reported that J. Henry Gardner has been named administrative assistant to director of public relations and advertising, Jones & Laughlin Steel Corp. Eugene F. Jannuzi has been named supervisor, product publicity and institutional advertising. William J. Troppman has been appointed supervisor, product advertising and promotion.

MINN. MINING APPOINTMENTS

It is reported that C. C. March has been appointed general manager — coated abrasives and related products division, and R. W. Mueller has been named general manager — fibrous and industrial tape division, Minnesota Mining & Mfg. Co., St. Paul, Minn.

MCMILLAN & TRESS, ING-RICH EXECUTIVES, RETIRE

Ingram-Richardson Mfg. Co., Beaver Falls, Pa., has announced the retirement of J. H. E. McMillan, vice president, and W. J. Tress, secretary-treasurer.

McMillan is retiring in his 50th year of service, Tress, in his 49th year. Both men continue as directors.

To succeed Tress is D. L. Brooks. F. B. Reese has been elected assistant secretary and and assistant treasurer.

YOUNGSTOWN SHEET UPS LEWIS

Thomas G. Lewis, a veteran of 30 years with The Youngstown Sheet and Tube Co., Youngstown, Ohio, has been appointed assistant to H. H. Waldschmidt, director of purchases. In his new position, Lewis will supervise the purchases for special projects including the larger construction programs.

HUMBLE NAMED VP & GEN. MGR. OF ALUMINUM INDUSTRIES

The appointment of Thomas L. Humble as vice president and general manager in charge of production at Aluminum Industries, Inc., Cincinnati, has been announced by Harrison O. Ash, president.

Prior to joining Aluminum Industries, Humble was with Chrysler Corp., Detroit, as a member of the vice president's staff of Plymouth.

ALCOA NAMES SMITH SALES VP

Harry L. Smith, Jr., formerly staff manager of product sales, has been elected a sales vice president of Aluminum Co. of America, Pittsburgh, announced the board of directors.

FOOTE SALES APPOINTMENT

Appointment of Robert J. Longenecker to the sales staff of Foote Mineral Co., Philadelphia, has been announced by John D. Clark, manager of ceramic sales. Longenecker was a member of the Foote research and development laboratories.

WESTINGHOUSE NAMES HENDERSON, KENNEDY

Bruce D. Henderson, vice president of Westinghouse Electric Corp., Pittsburgh, has been appointed to the apparatus products staff, and A. M. Kennedy, Jr. has been appointed general manager, purchases and traffic, succeeding Henderson. Kennedy was formerly assistant general manager of purchases.

SPEED-D-BURR BECOMES CORP.

The Speed-D-Burr Div. of Miller Machine Tool & Gauge Co., Glendale, Calif., is now to be known as the Speed-D-Burr Corp., according to H. J. Miller, president.

INT'L PAPER NAMES MCMAHON CHICAGO SALES MGR.

Charles R. McMahon has been appointed sales manager of the Chicago plant of the container div., International Paper Co., it was announced by Arthur B. Damon, general manager. McMahon was formerly assistant sales manager.

CUNO APPOINTS EDWARDS

George S. Edwards has been appointed exclusive sales representative by The Cuno Engineering Corp., Meriden, Conn., to handle their line of industrial fluid and gas filters.

CROWN ZELLERBACH, GAYLORD CONSIDERING MERGER

Crown Zellerbach Corp., San Francisco, and Gaylord Container Corp., New York, have announced plans for a possible merger of the two companies. The announcement was made by J. D. Zellerbach, Crown president, and Edwin J. Spiegel, Gaylord president.

PETERS-DALTON APPOINTS CALLISON & MCGUIRE

R. M. Richards, president, Peters-Dalton, Inc., Detroit, has announced two major executive appointments. Robert G. Callison, formerly sales manager, has been elected vice president in charge of regional sales and sales promotion.

Appointed to the position of general sales manager is T. Kenneth McGuire, formerly general manager of the industrial sheet metal div.

TRANE OPENS NEW COIL PLANT

The Trane Co., La Crosse, Wis., has announced the opening of its new 55,000 sq. ft. heat transfer coil manufacturing plant. The new plant, designed to increase present capacity 25-30%, consolidates all coil production operations into one location.

INTERNAT'L PAPER NAMES DIVISION MANAGERS

Charles H. Campbell has been appointed manager of the Manchester, N. H., plant of the container div., International Paper Co., New York City, it was announced by Arthur B. Damon, general manager.

Fred B. Rosenberger has been appointed assistant sales manager of the division's Somerville, Mass., plant.

U. S. STEEL EXPANDS FACILITIES

United States Steel Corp., Chicago, has announced that it is proceeding with the installation of facilities to produce continuous cold rolled light and heavy gauge stainless steel sheets and strip at its Vandergrift plant, and increasing the capacity at the Gary sheet and tin mill plant.

FRANK ASST. GENERAL MGR. PITTSBURGH PLATE DIVISION

Appointment of Edward R. Frank as assistant general manager of Forbes Finishes Div., Pittsburgh Plate Glass Co., Cleveland, has been announced by Charles H. Reed, division general manager. Frederick F. Rhue was named manager of sales service for the division.

R. G. CALLISON

R. B. PRESTON

T. K. MC GUIRE

ALLEN EMPTAGE

NATIONAL LEAD FORMS COMPANY IN ENGLAND

National Lead Co., New York City, has announced the formation of Abbey Chemicals, Ltd., in London, England, with production expected to begin early next year.

DETREX NAMES PRESTON

R. B. Preston has been appointed west-central manager and national accounts regional supervisor, it was announced by W. F. Newbery, director of sales, Detrex Corp., Detroit. Preston has been with Detrex since 1944.

NAME RUSSEY & ROSE BORG-WARNER VP'S

The election of E. S. Russey and A. W. Rose as vice presidents of Borg-Warner Corp., Chicago, has been announced by Roy C. Ingersoll, president and chairman of the board.

Russey, a director, is president and general manager of the Warner Gear Div. of Borg-Warner, Muncie, Ind. Rose is Pacific Coast representative of the corporation.

NEW PENNSALT OPERATING DIV.

Sharples Chemicals, Inc. has dissolved as a corporation and become an operating division of the Pennsylvania Salt Mfg. Co., Philadelphia, president William P. Drake has announced.

STEWART-WARNER BUYS JOHN W. HOBBS CORP.

An agreement has been signed between Stewart-Warner Corp., Chicago, and John W. Hobbs Corp. for the purchase by Stewart-Warner of the entire business of Hobbs, whose headquarters and plants are located at Springfield, Ill.

JENSEN KAWNEER SALES MGR.

Norman W. Jensen has been appointed sales manager of the Mill Products Div., Kawneer Co., Niles, Mich., according to Stephen A. Furbacher, division manager.

ALUMINUM INDUSTRIES NAMES BEMB VICE PRES.

Election of Walter J. Bemb as vice president in charge of customer relations of Aluminum Industries, Inc., Cincinnati, Ohio, has been announced by Harrison O. Ash, president. His headquarters will be in Detroit.

Bemb was formerly vice president and director of Houdaille-Hershey Corp.

SHAKEPROOF NAMES MACHAC

Frank Machac has been promoted to plant superintendent of the Shakeproof Div., Illinois Tool Works, Des Plaines, Ill., according to A. L. Pontius, general manager.

EMPTAGE TO INTERCHEMICAL ENGINEERING POST

Allen Leroy Emptage has been appointed head of Interchemical Corp.'s central engineering department in New York, succeeding Richard G. Knowland, who established the department in 1948 and who will continue on a part-time consulting basis.

TAYLOR TO PERMUTIT

The Permutit Co., New York City, has announced the appointment of George W. Taylor as chemical research engineer in the special applications dept.

FERRO

1920 1955

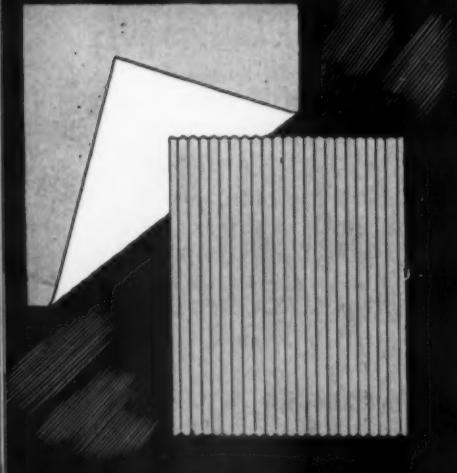
A business grown big through SERVICE

1953

Ferro enters field of Porcelain enamels for Aluminum.

1955

Ferro experiments with light-gauge Aluminum sheet promise whole new field for Porcelain enameling.



FERRO CORPORATION

cleveland • nashville • los angeles

IN CANADA: FERRO ENAMELS, LTD., OAKVILLE, ONT.

THREE-WAY MERGER PLAN OUTLINED BY WHIRLPOOL

In a letter to stockholders of Whirlpool Corp., Elisha Gray, president, has announced a 3-way merger proposal involving Whirlpool, Seeger Refrigerator Co., and the stove and air conditioning divisions of Radio Corp. of America.

Under the terms of the merger, a new corporation to be named Whirlpool-Seeger Corp. would be formed to own and operate the business now carried on by Whirlpool, Seeger, and the two RCA divisions. As presently contemplated, Gray would be president and chief executive officer, and Walter G. Seeger, Seeger chairman, would hold the same position in Whirlpool-Seeger.

The new company would have total assets of approximately 130 million dollars and a net worth of about 85 million.

Indirectly involved in the transaction is Sears, Roebuck & Co., which owns substantial shares of stock in both Whirlpool and Seeger. Sears would be a stockholder in the new company, as would RCA, but the total of their holdings would constitute less than 50 per cent of the total outstanding stock, Gray explained.

It was pointed out that the merger, of course, would require the approval of stockholders of Whirlpool, Seeger and RCA.

AHLMA APPOINTS BALCOM ASSOCIATE DIRECTOR

Robert W. Balcom has been appointed associate director of the American Home Laundry Manufac-

turers' Association, Chicago, it has been announced by Guenther Baumgart, AHLMA's executive director.

In the newly-created post, Balcom will assist the executive director in administrative duties, and will direct the Association's public relations and publicity activities.

For the past three and one-half years, Balcom has been an account executive with Harry Coleman & Co., public relations counseling firm for Whirlpool Corporation.

ANNOUNCE PROGRAM FOR ENAMELERS' SHOP PRACTICE FORUM

The Porcelain Enamel Institute has announced the advance program for its 17th annual Shop Practice Forum to be held at Ohio State University, Columbus, September 14-16.

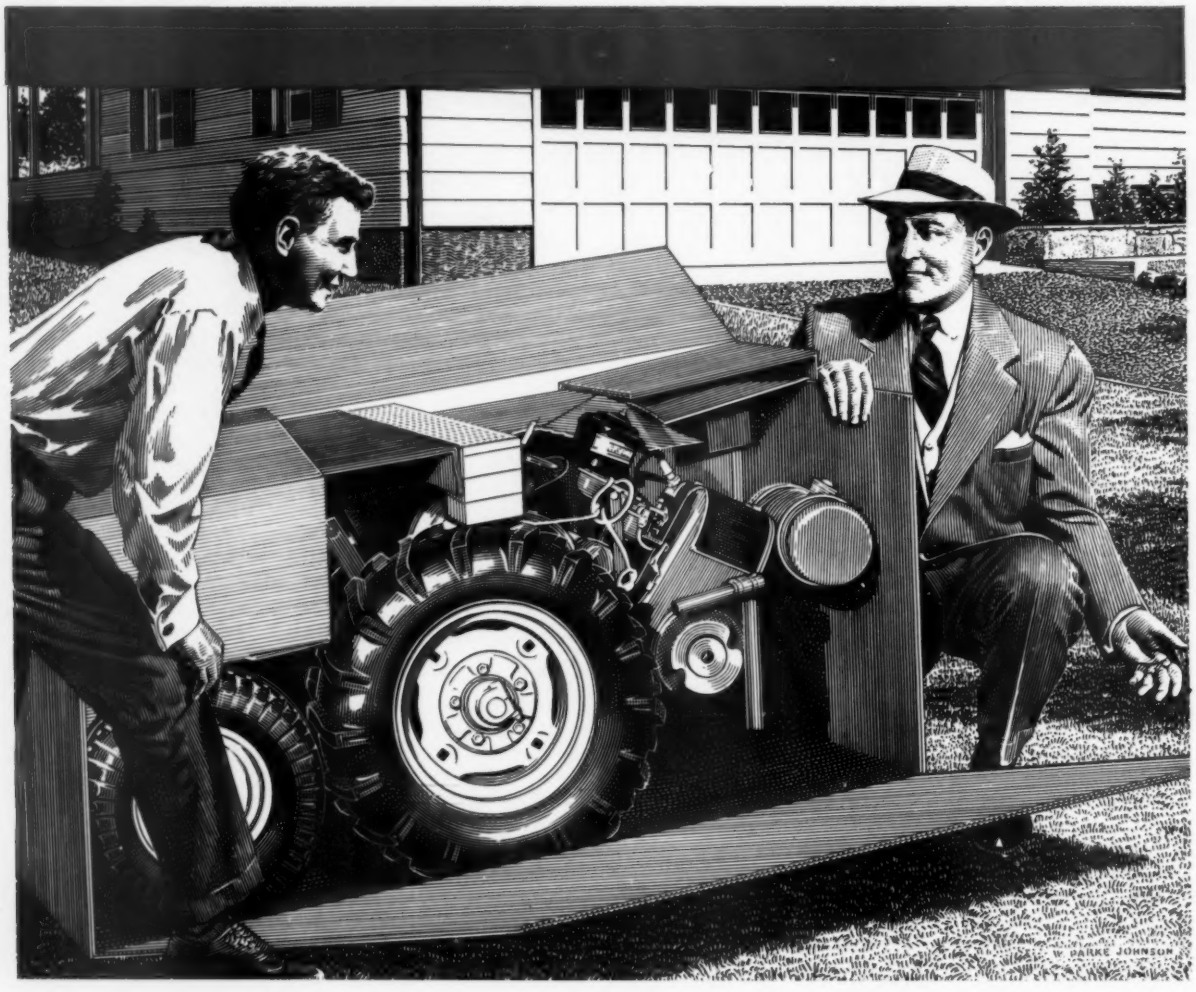
Subjects to be covered at the forum, as announced by the advance program, include the following:

September 14—"Where Are We Going in Ceramic Engineering Education?", "Coating Thickness Gage for Non-Magnetic Metals", "Ultrasonic Evaluation of Porcelain Enamel Bond Quality", "Fundamentals of Cathodic Protection", "Solution Ceramics for Enameling", "Porcelain Enamels Firing Below 1300° F.", "High Temperature Coatings", "Progress Report on ASTM Committee C-22", "Control of Sub-Sieve Fine Grinding", "Experience with Dry Drawing Compounds", "Plant Experiences with Porcelain Enamel on Aluminum", and "Mill Additions for Porcelain Enamel on Aluminum".

September 15—"A Look Ahead for Porcelain Enamel", "Overcoming Health Hazards in the Enameling Plant", "Highlights from the Year's Literature", "Designing for Porcelain Enameling", "Defining the Problem of One-Coat Processing", "Relation of Stress and Strain to Processing of Porcelain Enamel", "Practical Test Methods for the Porcelain Enameling Industry", "Progress in Processing by Committee Action", "Automatic Dipping", "Flow Coating of Ground Coat", "Electrostatic Application of Cover Coat", "The Number Two Electrostatic Spray Process", "Mechanical Cleaning", "Metal Preparation", "A Survey of Enamel Slip Storage Systems", and "Continuous Screening of Dip Enamel with an Enclosed Filter Unit."

September 16—"Weathering of Architectural Porcelain Enamel", "An Expanded Weathering Test Program", "A Psychological Approach to Color", "A System of Color Control for Appliance Production", "Color Measurements and Their Use", "Special Lighting for Color Matching", and "Color Systems."

August · 1955
safe transit
FROM ASSEMBLY LINE TO FINAL CUSTOMER



NOT ALL CUSTOMERS ARE MECHANICS

Gaylord Boxes

If your product has many parts, this may present a puzzling assembly problem to your customers One way to avoid complaints is to ship your product completely, or at least partially, set up. Even a 350-lb. garden tractor can be shipped "ready to roll" in a specially-designed Gaylord corrugated container.

For a fresh look at your own packing and shipping practices, call in your nearby Gaylord representative.

CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES • KRAFT BAGS AND SACKS

GAYLORD CONTAINER CORPORATION ★ ST. LOUIS

SALES OFFICES FROM COAST TO COAST ★ CONSULT YOUR LOCAL PHONE BOOK

ST-2

safe transit

A monthly trade publication section devoted to improved packaging and shipping and materials handling practices in the home appliance and metal products manufacturing field.

Plant experience information for all executives and plant men interested in the problem of packaging and shipping improvement and loss prevention.

Complete information on the National Safe Transit pre-shipment testing program for packaged finished products, and detailed progress reports of divisions and sub-committees of the National Safe Transit Committee.

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Elmhurst, Illinois
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Safe Transit certification *— for all five departments at General Electric's Appliance Park, Louisville, was recently announced by the National Safe Transit Committee. The men who "deliver the goods" (packaged appliances) for G-E are, left to right: James Stover, packaging engineer, room air conditioner dept.; Edward J. Powlenko, packaging engineer, home laundry and dishwasher and disposal departments; Harry J. Benzie, Appliance Park traffic manager; James W. Svendsen, packaging engineer, range and water heater department; William H. Haden, packaging engineer, household refrigerator department; and Paul O. Vogt, packaging engineer, manufacturing services division, Schenectady, N. Y. (See news story, Page ST-14.)*

Assembly and crating line *— for water heaters at Heintz Manufacturing Company, Philadelphia, Pa. Hydraulic device is used to lower water heaters from waist high assembly conveyor to floor level packaging conveyor. (Read production story starting on Page 19.)*

DESIGNED to go places

HEAVY-DUTY SHIPPING CONTAINERS FOR *Maytag*

MAYTAG's container, built by INTERNATIONAL, offers many definite advantages:

- Large automatic gluer insures uniform high quality results and at the same time economizes on material.
- Time saving in packing . . . proved by actual time studies.
- Easier to uncrate. Saves 33⅓% on labor compared to older methods.
- Less claims for damages in transit . . . tare weight reduced.
- Approved by Consolidated and Uniform Freight Classifications Committee for rail shipments.
- Dust proof construction. Machines arrive factory fresh.
- Large surfaces give ample room for identification of contents and strong advertising story which ties in with national advertising.

Would you like to know how this versatile, sturdy container can be adapted to meet your specific needs? Write us for further information. INTERNATIONAL's heavy-duty shipping containers are designed to go places. *And*—provide safe transit!

International Paper company
CONTAINER DIVISION
220 East 42nd Street, New York 17, N. Y.

...ne impact testing machine. Note lower left hand corner of ...stic crate extends beyond edge of dolly so that full impact is felt on the crate when the dolly is released.

Vibration testing machine. An acceleration of 1G plus allows thin carboard to move freely under the crate which leaves platform when vibrating. Domestic crate in foreground, export crate in background.

National Safe Transit applied to distribution transformers

by D. E. Stallings • APPLICATION ENGINEER, TRANSFORMER DIVISION, WESTINGHOUSE ELECTRIC CORPORATION, SHARON, PENNSYLVANIA

THE National Safe Transit label was applied to a distribution transformer for the first time in late 1954.

With the help and cooperation of our appliance division in Mansfield, Ohio, the label was adopted for a new line of distribution transformers developed by the company that went into production in October, 1954. The label is now being applied to all 5, 10, 15, and 25-kva transformers. The label will be applied to all ratings of distribution transformers through 167-kva as soon as test equipment is installed at the Sharon plant, and the changeover to the new line is complete.

The National Safe Transit testing machinery located at the appliance division was used for the initial tests, which were conducted on six different styles of transformers then in production. The units were picked at random from stock. Each transformer was given a vibration test for one hour on the package tester at an acceleration of 1G plus. Each transformer also received the standard impact test on each side, and on the bottom. The impact test was made on the Conbur incline testing machine at an impact in the fifth zone (recorded on a two-way recorder).

After these tests were completed the transformers were returned to the Sharon plant, removed from their crates, and inspected. This inspection revealed that the crates

to Page ST-15 →

This photo shows the first National Safe Transit Label being applied to a distribution transformer at the Westinghouse plant in Sharon, Pa.

Incline impact tester

14′ revolving drum tester

Drop tester and 7′ revolving drum tester

Designing a wirebound container

Vibration tester

General Box behavior clinic for shipping containers

When General Box designs and tests a container for your product, there's little room left for guesswork about its behavior. Some of the reasons are illustrated above. How it will handle in your plant, how it will pack, how it will ship, and how it will arrive and unpack are all considered.

General Box design engineers know the importance to you of every possible saving in packing, shipping, and direct container costs. And every month they design containers for all kinds of things—machine tools that weigh several tons . . . "hard to pack" products like radar antenna . . . major appliances . . . component parts in bulk.

Whether you believe the best container for your product will be a toughie or a snap to design, it will pay you to find out what the General Box answer is. It's easy to do—just let us send a man. No obligation. Write for your copy of the "Heavy Duty" issue of "General Box."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes

General Box

1823 Miner Street, Des Plaines, Ill.

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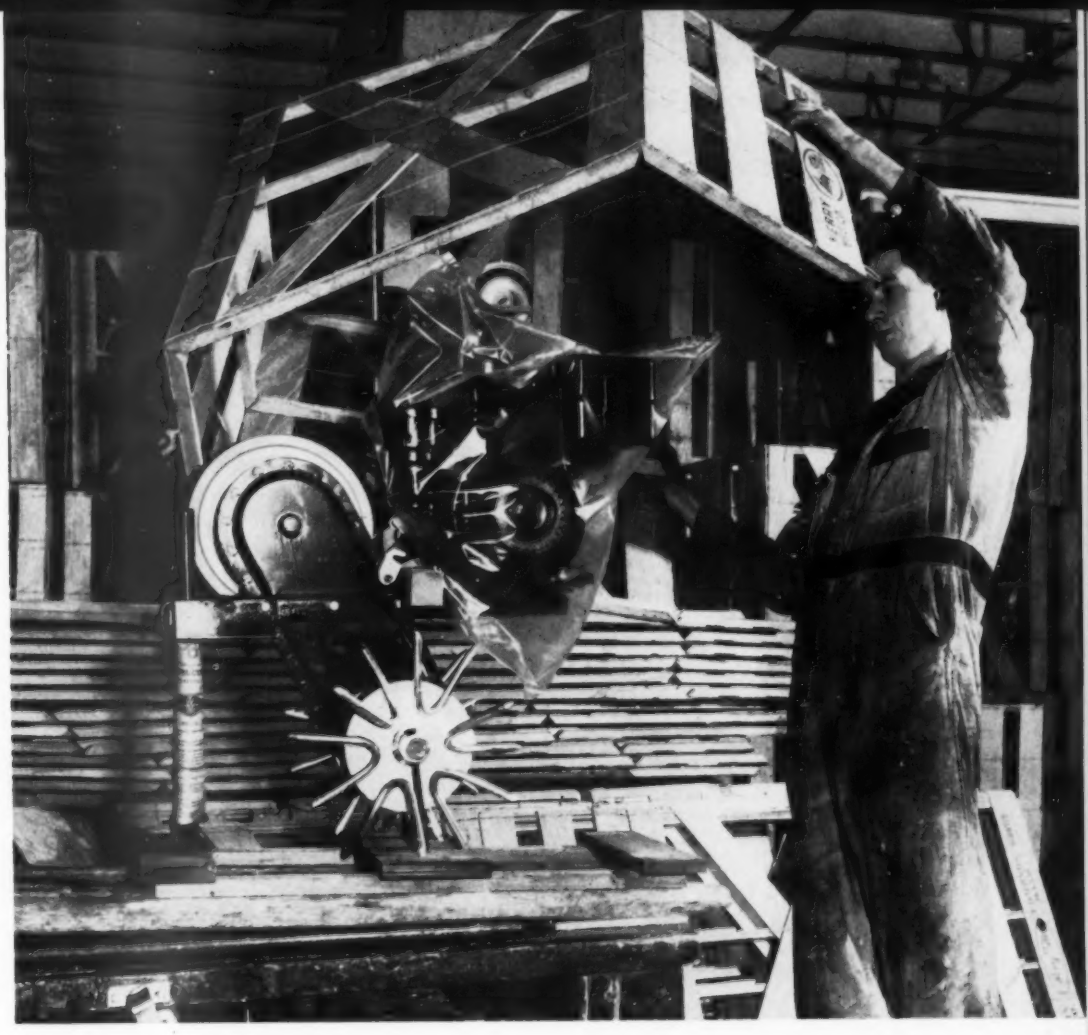


Worker lifts the four sides of wrap-around crate blank into position over a roto-tiller being packed at the plant of Merry Mfg. Co., Edmonds, Wash. A plastic bag is used to protect the engine from dust and moisture.

"Merry Tiller" unearths a protective shipping container

sharp tines of roto-tiller present a tricky packing problem for manufacturer

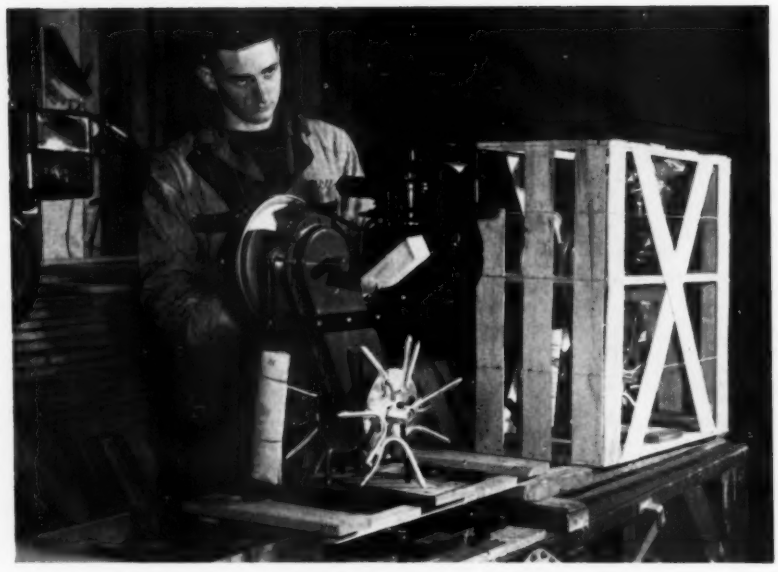
THE sharp tines of its engine-driven roto-tiller will dig their way out of flimsy shipping containers as well as through hard soil, Merry Manufacturing Co., Edmonds, Wash., discovered in searching for a dependable protective shipping container for its 85-pound "Merry Tiller."

Instead of wheels, the machine has sharply pointed tines that serve both to dig into the earth and to provide traction. At the rear is suspended a metal skid grip which controls the depth of digging through pressure exerted on the handles and upon which the machine rests when inoperative.

The machine's sharp tines, peculiar shape and unequal weight distribution present a tricky packing problem when the "Merry Tiller" is ready to be packed for shipment, completely assembled except for handles.

Merry Manufacturing experimented with many different types and designs of boxes and crates in seeking a shipping container that would at once be thoroughly protective, easily and economically packed, and wholly dependable. None was found to

Right: A single piece of wooden blocking, being placed in position here, is the only special interior packing needed.



satisfy all needs until shipping container engineers collaborated with company officials to create the wrap-around crate now used for the "Merry Tiller."

The present crate consists only of the base, the top, and the one-piece wirebound blank that comprises the four sides, plus one piece of wooden interior blocking. The entire container is received at the plant completely prefabricated.

A. W. Fyall, plant superintendent, said that only six man-minutes are charged to the complete packing operation as compared to up to 13 man-minutes for previous methods of packing. No pre-assembling of the wirebound crate is necessary; it is assembled as used.

Bolted to crate base through pre-bored holes

A "Merry Tiller" first is secured to the base of the crate by two long steel bolts slipped through pre-bored holes in the crate base and holes in the machine's axle for securing attachments. The one-piece wrap-around blank is folded into shape and placed about the base of the crate and closed with wire-loop fasteners, the single piece of wooden interior blocking is nailed in position, and the crate top then is placed and secured with a few nails. The two bolts and the metal skid grip at the rear of the machine provide it with three-point support.

One of the great benefits accruing from their conversion to wirebound crates, Fyall said, is greatly increased good will on part of dealers through the elimination of hidden damage and the elimination of shipping container damage as the result of rough handling and tearing by the machine's tines.

Right: After crate is closed with wire-loop fasteners, top is placed in position and secured with nails.

Below: The one-piece crate blank, comprising the four sides of crate is closed so that its bottom cleats snugly engage the base of the crate.

EXPORT: Placing a Chicago Mill and Lumber container over a Voronado air conditioner on the O. A. Sutton assembly line.

DOMESTIC: An air conditioner in "offset" type wirebound crate on the dolly of the incline impact test machine.

CHICAGO MILL helps SUTTON *Deliver Safely*

The O. A. Sutton Corporation, manufacturers of air conditioning units and fans, is another one of the leading appliance manufacturers using Chicago Mill and Lumber Company containers to provide safe shipment for their finished product. Where the going is toughest (export) Chicago Mill provides safe delivery any place in the world with hinge-corner plywood. For domestic delivery of large units, wirebound is the answer.

In order to meet the requirements of the growing air conditioning industry, Chicago Mill had its engineers design the best possible container for the protection and shipment of room air conditioners (for domestic or export). The hinged corner plywood container that was developed offers these advantages:

- Maximum protection
- Low cost
- Fast assembly
- You can stack them 20 high for compact storage with a good factor of safety.

Contact your Chicago Mill representative for complete information

Wirebound
Nailed or Hinge Corner
Cleated Plywood
Cleated Craveneer
Cleated Corrugated
Watkins Type Containers
Shop and Tote Boxes
Woodsteel Nesting Boxes

★

FOR DOMESTIC OR EXPORT
FOR PEACE OR DEFENSE

A shipping container for every shipping purpose.

FOR SAFER TRANSIT BY • TRUCK • BOAT • TRAIN • PLANE

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street — Chicago 3, Illinois

Plants at: Helena, Arkansas • Greenville, Mississippi • Rockmart, Georgia
Tallulah, Louisiana • South Fork, Colorado • Chicago, Illinois

SAFE TRANSIT NEWS

NATIONAL SAFE TRANSIT COMMITTEE

Associations Building, 1145 - 19th St., N. W., Washington 6, D. C.

New Certifications - The following companies were recently certified under the National Safe Transit Program:

Anchor Division, Stratton & Terstegge Company, New Albany, Ind.
General Electric Company, Major Appliance Division, Louisville, Ky.
Humphryes Manufacturing Company, Mansfield, Ohio
Philco Corporation, Mount Clemens, Michigan
Simonds Worden White Co., Dayton, Ohio
Universal Major Elec Appliances, Inc., Artkraft Mfg. Co., Lima, Ohio
Westinghouse Electric Corporation, East Pittsburgh, Penna.

- - - - -

NST - A Public Relations Tool - Simonds Abrasive Company, Philadelphia, Pa., announced their certification in a bulletin to their sales organization and to principal executives of their industrial supply distributors throughout the country. Approximately 500 persons received the announcement which read in part, "Such certification entitles us to display the Safe Transit label on our packages - see sample attached. Look for these labels on our packages. They are your assurance that Simonds Abrasive Company products are being shipped for safe arrival."

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Reduced Damages - York Corporation, York, Penna., recently estimated that their shipping damages prior to Safe Transit testing were in the magnitude of 5% to 10% of their units shipped. Since adoption of the NST Program their records show that failures have dropped to .5%. Other benefits cited included increased awareness on the part of their unit designers of the shipping problems which can be solved by design considerations, and improved relations with distributors.

- - - - -

ATA Meeting Features NST Program - American Trucking Associations, Inc., National Freight Claim Council, recently held its 18th Annual Membership Meeting in Chicago, Ill. John M. Miller, Executive Secretary, told the members that one of the greatest contributions to the achievement of perfect shipping by better packaging has been made by the NST Committee and its Safe Transit Program. "The NST Program, however," said Mr. Miller, "is not merely a one-way street for manufacturers. All types of carriers are tied into this program and it is our obligation and pledge that we will instruct our own employees that shipments carrying the Safe Transit label will be accorded the best possible handling." Mr. Miller then further outlined the ways in which ATA members could cooperate with the Committee.

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AAR Features Safe Transit Label - The Association of American Railroads highlighted the Safe Transit label in the June issue of its publication, "Perfect Shipping News," which is distributed to more than 43,000 railroaders and 26,000 shippers and receivers of rail freight. The featuring of the Safe Transit label in this monthly publication is part of the Association's campaign to familiarize railroad personnel with the manufacturer's emblem of participation in the National Safe Transit Program.

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AAR Educational Seminar - The Eleventh Educational Seminar of the Association of American Railroads was held July 25-29. As in the past, the Seminar included a presentation of material on the National Safe Transit Program.

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Safe Transit Speakers Bureau - Advance speaking engagements of the NST Speakers Bureau include a presentation at the February National TAPPI meeting in 1956.

- - - - -

"We found out how to save up to 30%,"

says Arthur Ratner
President,
Rentar Packaging Co., Inc.

"As independent export packagers of appliances for General Electric and other leading manufacturers, we can't risk costly damage claims.

"Shipping for export calls for extreme care in packing to prevent denting and scratching. We must have sturdy, light-weight containers to cut handling and shipping costs and guard against damage claims.

"That's why we rely on Atlas Plywood lab-tested containers to help us keep costs down in so many ways. We often save up to 30% for our customers."

Functional design makes this General Electric Refrigerator welcome anywhere. To insure the safest inside and outside protection for appliances during shipment, Rentar consulted Atlas Plywood packaging engineers. Jars and jolts of travel are no longer a headache in Atlas Plywood containers.

Atlas Plywood Cases like this are engineered to cushion the contents like a "second skin". They are Rentar's first choice for better, lower cost containers for leading manufacturers who are export shipping clients. Workers like their easy handling. Damage claims have plummeted.

FREE Booklet!

New, illustrated 24-page booklet, "How Atlas Plywood Cuts Your Shipping Costs . . . Safely," may help you avoid needless product damage or too-high freight costs. Write — or see your Atlas Plywood representative (see yellow pages). Learn about the Laboratory where Atlas Plywood containers win their lab-tested label. Atlas Plywood Corporation, Dept. F-12, 1432 Statler Bldg., Boston 16, Mass.

Atlas Plywood
CORPORATION
FROM AMERICAN FOREST TO FINISHED PRODUCT
PLYWOOD CONTAINERS • FLUSH DOORS • HARDWOOD PANELS

NST certifies first cast iron plumbing ware manufacturer

Left: M. H. Vereeke, Humphryes general sales manager, watches as R. H. Hafner, secretary, applies a Safe Transit label to a crated bathtub.

Below: Surrounding Don Jones, Humphryes president, who is holding their NST certification, are, left to right: Messrs. Vereeke, Hafner, Glenn Hutt, Ralph Bisbee, John Oliver, E. H. Shands, P. E. Griggs, and Paul Bush.

AT A recent meeting in Mansfield, Ohio, the first National Safe Transit Committee certificate ever awarded to a manufacturer of enameled cast iron plumbing fixtures was presented to Humphryes Manufacturing Co.

The presentation was made by Glenn A. Hutt, of Ferro Corporation, Cleveland, and president of the Porcelain Enamel Institute, to D. J. Jones, Humphryes president. The presentation climaxed a meeting attended by national, state and local transportation representatives and packaging and industrial executives. In accepting the certification, Jones pledged his company's compliance with the Committee's procedures.

Humphryes will now use the Safe Transit label on all of its packaged products as they are tested to comply with the NST standards.

In speaking before the meeting, M. H. Vereeke, general sales manager of the company, said, "We are all enthusiastic and proud of this recognition because this means real savings both in time and money."

Representatives of the NST Committee in attendance at the meeting included R. F. Bisbee, general chairman, and Paul Bush, chairman of technical planning (Westinghouse); Gilbert Dobson (Tappan Stove); E. H. Shands (Hommel); John C. Oliver, NST secretary; and Glenn Hutt.

Representing the carriers as a part of the formal program were P. E. Griggs, of the Association of American Railroads; L. C. Dearman, president of the Mansfield Trucking Association; and Herschel Atkinson, representing the Ohio Trucking Association and the American Trucking Association, Inc.

PACKAGING, HANDLING SHOW MOVES TO NEW YORK CITY

For the first time in its 10-year history, the Society of Industrial Packaging and Materials Handling Engineers (SIPMHE) will present its annual Packaging & Handling Exposition in New York City, at Kingsbridge Armory, September 20-22.

A "triple feature" trade show, the 10th anniversary exposition will combine manufacturers' exhibits, short course technical sessions presented in cooperation with New York University, and national competition for outstanding achievement in specific

SIGNODE Strapping Station Handles Interlocking Flange Containers—2 a Minute

Here is high-speed, conveyorized production line packaging equipment that enables two men to fold, hold and strap *two* complete interlocking flange containers per minute . . . 120 an hour!

S-75 handles containers up to 41" x 50"

This conveyorized strapping station can handle containers ranging in width from 18" to 41" . . . and in length from 18" to 50". Adjustment for width is made in a matter of seconds. Adjustment for length is provided automatically by a set of five spring-loaded stops.

Offers new ways to cut costs

The S-75 Strapping Station breaks the bottleneck that formerly restricted the use of interlocking flange containers, and the savings in strapping time, strap used, manpower and handling time alone will quickly pay for this low-cost, profitable conveyorized strapping installation. For complete information write:

SIGNODE
STEEL STRAPPING COMPANY
2639 N. Western Ave., Chicago 47, Ill.

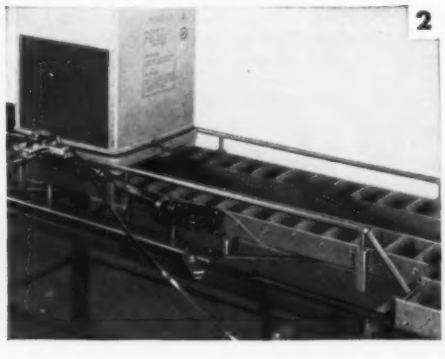
THIS SEAL MEANS SIGNODE SECURITY IN SHIPPING

In Canada: Canadian Steel Strapping Co., Ltd., Montreal, Toronto
Offices Coast to Coast. Foreign Subsidiaries and Distributors World-Wide

(1 & 2) Rails hold folded side flaps. The forward stop (photo #1) holds front flap. Spring-loaded stops (photo #2) rise automatically as container passes over them to hold rear flap. Steel strapping is passed around the container, and is tensioned and sealed by a Signode sealfeed strapping machine. A special tool mount and balance arm hold the machine at the right level for strapping. When the machine is depressed it is disengaged and the front stop is released, so the container can move on down the line to the next position.

(3) Top cap is folded and held in position by a simple jig. Strapping tool, suspended from a spring balancer, tensions and seals the draped strapping.

1


2

3

packaging and handling applications.

The theme of the show will be "*A Decade of Progress*", and SIPMHE has asked exhibitors to feature materials, equipment and techniques which exemplify the industry's progress since World War II.

The event is expected to attract thousands of industrial representatives who will be attending for the first time, according to SIPMHE's president, Earl B. Candell, of General Electric's lamp division.

NST CERTIFICATION FOR G-E APPLIANCE PARK PLANTS

five departmental plants of Major Appliance Division join the growing list of NST certified plants

ALL five departments of General Electric Company's Major Appliance Division, Appliance Park, Louisville, Kentucky, have been officially certified under the National Safe Transit Program. Announcement of the certification was made by John C. Oliver, secretary of the National Safe Transit Committee.

Commenting on the certification of General Electric Company's Major Appliance Division, J. W. Svendsen, chairman of the company's packaging committee, made the following statement:

"*It is the opinion of our Appliance Park Packaging Committee that all shippers and carriers should support this program of shipper and carrier cooperation. The Major Appliance Division of the General Electric Company has used these standards for some years. This program of testing has resulted in improved product protection at less cost.*"

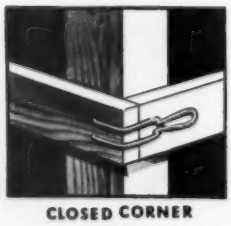
Participating on an individual basis in the National Safe Transit Program will be the following departments of this leading company's Major Appliance Division: 1. Dishwasher and Disposall Department, 2. Home Laundry Department, 3. Household Refrigerator Department, 4. Range and Water Heater Department, and 5. Room Air Conditioner Department.

R. F. Bisbee, general chairman of the National Safe Transit Committee, expressed the Committee's pleasure in the new certifications. "We are confident," he said, "that this endorsement of our pre-shipment testing program by all five departments of General Electric's Major Appliance Division will underline for all shippers and carriers the conviction of our participants that the National Safe Transit program is ushering in a new age in shipping."

The current job before the Safe Transit Committee is one of getting complete information on the program into the hands of the manufacturers. Experience indicates that, once a manufacturer is fully acquainted with the program's many benefits, he is eager to take the necessary steps toward certification. The participation and support of General Electric and other leading producers make an important contribution to the educational work of the Committee.

The endorsement of the National Safe Transit program by such organ-

OPEN CORNER



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B-G Containers are delivered flat, in 3 completely assembled sections. Pre-drilled nail holes. Unique Tight-Corner feature. Palletized for fork-lift handling, saves time and storage space.

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izations as General Electric Company's Major Appliance Division adds to the program's already tremendous impact upon carriers, dealers and distributors. Each certified company derives many benefits through participation and, at the same time helps to advance the program toward its goal. The National Safe Transit program provides the framework wherein carriers and shippers can give full recognition to their inter-dependence in achieving the common objective of reduced in-transit damages.

Safe Transit applied to transformers

→ *from Page ST-5*

"softened" somewhat, and the transformers shifted within their respective crates causing the paint to wear off portions of the tank. The internal parts of the transformers withstood the tests very satisfactorily and no corrective changes were required. The packing crates were reinforced immediately by adding an additional cross member to the top of each crate. The recessed block on the bottom of the crate (which helps to support the transformer in the crate) was doubled in width (from 4″ to 8″) and the number of nails holding this board was increased from 2 to 4 on each end.

Three hand-made experimental transformers from the new line then underwent the same series of tests except that the vibration test was increased to a period of two hours. The results were good—no softening of the crate, shifting within the crate, or internal weaknesses appeared.

Very shortly after mass production started on the new transformers, four units were again picked at random for the two-hour vibration and impact tests (fifth zone). The results of the tests run on the first production units were satisfactory, and the National Safe Transit Label was applied to these transformers.

Test to be conducted daily

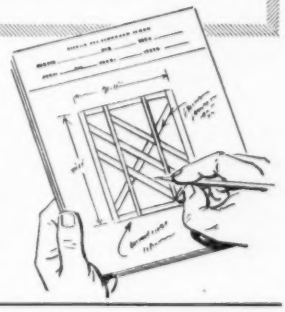
National Safe Transit equipment has been purchased and is now being installed at the transformer division. The vibration tester will have a table 6 feet x 8 feet. The inclined plane will be 16 feet long with 10-degree slope. The backstop will be perpendicular to the inclined plane. When this equipment is ready for operation, daily systematic and statistical tests will be performed. Present planning calls for testing at least one of each style transformer that comes off the production line each day. The transformers will be taken from the production line just after they are placed in their crates, but before the units are put in stock.

Gradually, use of the equipment will be expanded to test instrument transformers, dry-type transformers, and other products shipped from Sharon that weigh 2000 pounds or less. This equipment will also be used by design engineers to verify ruggedness of component parts and complete equipments. Special tests are also planned for crates having spiral and corregated nails.

HOW

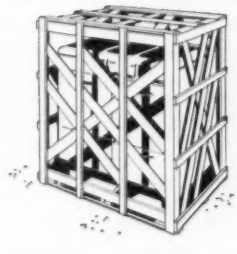
Special Crate Designing

HELPS SAVE MONEY



1 Crates designed to meet specific needs are usually much more economical than general-purpose crates. For example, Weyerhaeuser designing and engineering has reduced crating costs as much as 40% through lighter weight, easier assembly and simplified nailing.

2 Construction and assembly of each section in the laboratory assures accuracy, adequate coverage, economical and practical use of material. You know in advance that Weyerhaeuser crates are rigid and strong, without depending on contents for support.



3 This special care in designing means Weyerhaeuser crates are very light for their strength . . . planned for quick, inexpensive assembly, with no pre-drilling. They come neatly bundled for easy handling. Write for a folder on Weyerhaeuser industrial wood parts, or ask for information concerning your particular needs.

Weyerhaeuser Sales Company

Industrial Wood Parts Department

Room 2111 • 400 West Madison • Chicago 6, Illinois

New Industrial Literature

801. Vitreous enamel on aluminum castings

New This development is detailed in a brochure just published. Results of tests conducted are detailed in the new brochure. Advantages of vitreous enamel as both a colorful finish and abrasion resistant protective coating are outlined. Technical data offers design engineers information that will provide a preliminary basis for investigating product applications.

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802. "Aluminum Forgings"

New Completely illustrated, the text describes press forgings, impact extrusions, and hand forgings. Among the advantages of aluminum forgings that are outlined are grain control, light weight, excellent finish, and ease of machining. In addition, the book enumerates the mechanical properties of aluminum forging alloys and summarizes typical forging applications.

---

803. 32-page illustrated booklet on enameling iron

New A new booklet deals with the subject of porcelain enamel and enameling iron in a comprehensive manner. A section on enameling iron covers such points as uniformity, surface, mechanical properties, and gages and sizes. There are other sections on *design* for porcelain enamel parts, *fabrication*, *cleaning* and pickling, good enameling practice, *testing*, and safe crating. Besides many excellent photographs, the booklet contains useful tables, design drawings and charts.

---

804. 8-page brochure on stainless fasteners

New Included are style and size data about stainless screws, bolts, nuts, washers, rivets, "AN" fasteners, etc. Available body and head styles are illustrated.

805. "Gets There Safe 'N Easy

New The booklet utilizes shipping boxes, appliance crates, etc., to illustrate markets served by nailed wooden boxes and crates. Inherent characteristics plus careful design of nailed wooden packages, according to the booklet, are responsible for the dominance of this type container in many markets. The booklet is non-technical in nature.

---

806. "A Better Bond . . For Organic Finishes"

New This pamphlet describes in detail a complete line of phosphating compounds. In addition to a general discussion of phosphating, metal treatment prior to painting and metal treatment prior to other organic finishing, the brochure includes a "Phosphating Reference Chart". This chart outlines the purpose of each material, the recommended uses, government specifications met, methods of application, equipment requirements, metals to be used on, coating weights and complete operation cycle.

---

807. Process of iron phosphating on steel

New The process by which iron phosphate coatings improve paint adherence and prevent corrosion on steel is lucidly explained and diagrammed in a new booklet. "How to Apply Iron Phosphate Coatings to Steel in Preparation for Painting," the 12-page booklet, points out that the selection of iron or zinc phosphate treatments depends upon the purpose for which the article is intended. It tells how the process cleans and phosphates at the same time; adds luster to the finish, which also has less tendency to chip or flake; protects against corrosion; saves paint and saves money, because it has long life in solution, and reduces the number of steps in the pre-paint conditioning operation.

808. Alkaline stripper for rust, paint, phosphate coatings

New A method of removing paint, phosphate coatings, rust, and oil from metal surfaces — a method that is said to eliminate as many as six operations—is described in a folder recently published. The folder discusses this new alkaline detergent which, the manufacturers claim, simultaneously removes rust and grease from new products; rust, paint and phosphate coatings from rejects and from used products which are to be refinished. The folder tells how it can eliminate such operations as pickling, vapor degreasing, and wire brushing.

---

809. Manual aids gear selection, use, maintenance

New A new engineering manual on the complete line of Duti-Rated Lifetime gearing has been released. All standard gear sets available are listed by center distance and capacity, to give designers the most complete and convenient selection possible to suit specific applications.

In addition to illustrating and listing the line, with complete specifications, the book contains material helpful in the selection of proper gear sets. Efficient, space-saving gear arrangements are shown, and a section is devoted to gear maintenance tips.

---

810. Aluminum standard shapes book

New Standard shapes available from existing tooling are described and illustrated in a 60-page book. The catalog was prepared to assist manufacturers, fabricators, and engineers who utilize standard aluminum sections.

Indexed for easy reference, the publication covers the following classifications: standard shapes, such as angles, tees, channels, etc.; rod and bar; tube; architectural and moulding; trailer. It lists the various sizes, dimensions, weight, etc., of shapes available within these tooling categories.

811. Zinc phosphate coatings

New Manufacturers whose painted steel products must withstand long exposure to humidity and the elements will be interested in a new booklet, "How to Apply Zinc Phosphate Coatings to Steel in Preparation for Painting." The booklet describes the zinc phosphating materials used to give paint-anchoring, corrosion-resisting coatings that usually weigh more than 200 milligrams per square foot of surface.

The booklet illustrates and explains the action of the process in converting the steel surface into a complex, heavy phosphate layer chemically bound to the metal, and shows how this coating improves paint adhesion and prevents the spread of corrosion under the paint, prolonging paint life as much as ten times. Common uses, solution strengths, and temperatures of the various zinc phosphating materials — for spray washing, tank immersion, and final rinsing — are described. The booklet also outlines the simple control procedure required by this process.

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812. Molded parts catalog

New Facilities and products of a manufacturer of O-Rings and precision molded parts for industrial, commercial and aircraft use are described in a revised two-color, 24 page illustrated catalog just off the press. The company produces a wide range of custom molded parts, thermolastic and synthetic rubber O-Rings, and hydraulic packings to government and commercial specifications.

Permadizing, a unique rubber-to-metal bonding process is described in the catalog, and the company's method for scaling O-Rings in individual pouches to meet military requirements is illustrated.

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813. Preheating chart

New This preheating chart lists in a clear, concise manner the recommended preheat temperatures for 79 commonly used metals and alloys. Plain carbon steels, high tensile steels, medium chrome moly steels, and plain chrome steels are some of the metal groups for which approximate compositions and recommended preheat temperatures are shown. Factors influencing temperatures and the desirable effects of correct preheating on metal properties are enumerated.

The chart has found wide acceptance as an authoritative source of preheating data in the metal working field.

---

814. Booklet on new welding process

New The performance and applications of a new consumable electrode inert gas welding process are given in a new booklet. This 7-page booklet answers the questions: What can it do? Where can it be used? What are the operating costs? What are the components?

Descriptions of fillet, lap, butt, and plug welds made with the new process are accompanied by actual photos. Weld cross sections are also shown. The booklet points out how the arc stability of the new process effects operating costs in terms of gas consumption, and time required for cleaning.

The booklet also presents comparison curves of welding speed versus fillet size for the new process and other typical welding processes as well as similar curves of depsotion rates. A table of physical properties is also given.

815. "Flaw Location by Dye Penetrants"

New This twelve-page booklet describes in detail the Dy-Chek inspection method and offers helpful suggestions on how to perform inspections on any metal by the dye penetrant method.

The Dy-Chek method of flaw location is basically a hide-and-seek process. Following cleaning, a red dye penetrant is applied to the surface being inspected. After being allowed to dwell sufficiently long for it to hide in any flaw — no matter how small — that may be present on the surface of the metal, the excess penetrant is removed from the surface of the part being inspected. A white developer is then applied to the surface. This developer seeks out the penetrant hidden in the flaw. As the developer dries, it pulls the hidden penetrant to the surface of the part. The red penetrant thus bleeds into the white developer, marking with photographic clarity any defects that exist.

Key to the exceptional accuracy of the process is said to be the remover-emulsifier, the material used for removing the excess surface penetrant from the part. The manufacturer points out that his penetrant is not water soluble, but is rendered removable with water only after application of the remover-emulsifier. Thus, after application of remover-emulsifier, water may be freely used to remove excess penetrant without any danger whatsoever of removing penetrant from shallow cracks or cold shuts.

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CERAMIC ENGINEERS — recent graduates or up to 3 years experience — for development work on porcelain enamel materials, processes and products in the Engineering Department Laboratory. Provide personal and experience data, and address the **Employment Director, Frigidaire Division of General Motors, Dayton 1, Ohio**

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